NOKIA

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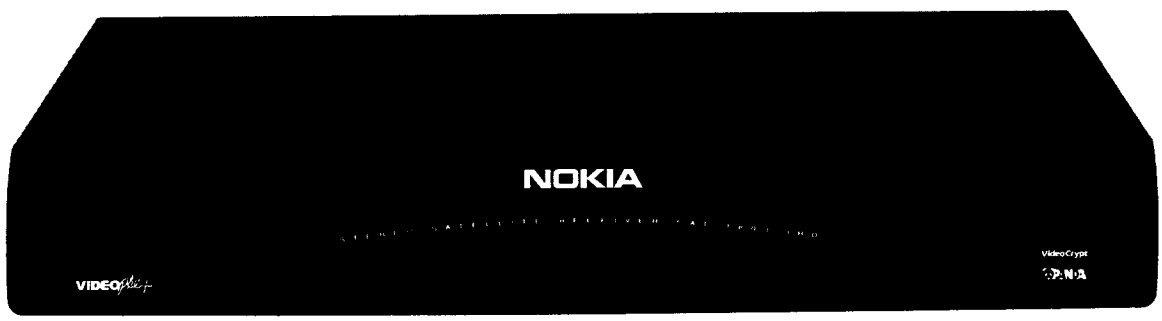
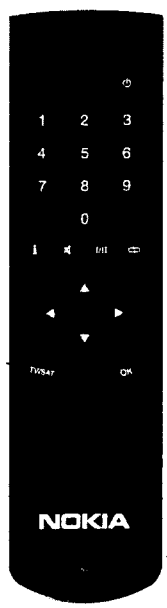
Service Manual

VideoCrypt Satellite Receiver

SAT 1800 IRD





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Videocrypt circuit description and diagram

For copyright reasons, these have been printed on special paper, part of which has been overprinted with broad diagonal stripes to prevent photocopying. Each of these sheets has a unique, traceable registrated serial number and is handled separately from case to case.

Wiring the plug (UK and Eire only)

The mains lead is already fitted with a moulded plug. In the unlikely event that you would need to replace the plug follow the directions below.

CAUTION: The supplied plug is not designed to be rewired. Should your socket outlet not be suitable for the plug supplied, the plug must be cut off and an appropriate one fitted. In this case you must dispose of the old plug safely. Under no circumstances should it be inserted in an electrical socket.

The wires in the mains lead are coloured BLUE for neutral, BROWN for live. If the colours of the receiver mains lead wires do not correspond with the markings in your plug, connect the:

- BLUE wire to the terminal marked "N "or coloured BLACK
- BROWN wire to the terminal marked "L"or coloured RED.
- NEVER connect the BLUE or BROWN wire to the terminal marked 'E' or coloured GREEN.

To protect the receiver, fit a 5 amp fuse (BS 1362) to the mains plug. The required alternating current (AC) mains supply is 230 volts (50 Hz).

If in doubt, consult a competent electrician.

We reserve the right to change specifications!

Introduction

Variant number

Shown on the label at the bottom of the unit (e.g. 262 5957-XX).

Manufacturing number

Shown on a label at the bottom of the unit.

PCB number

Shown on each PCB (e.g. 55 31848-XX).

Screws

The "Torx" screws are used on this units. Thus, a special Torx screwdriver size No.10 is required.

Surface-Mounted Device (SMD)

SMDs are glued and soldered.
In order not to damage the P.C. board, e.g. when replacing ICs and similar components with many soldering points, special tools are required when servicing SMDs.
Use the circuit diagram and P.C. board drawing to locate components.
Resistors may carry the following code:
The first two digits indicate the resistance, while the third one indicates the number of trailing zeros. Thus, 473 = 47000 Ω, while 470 = 47 Ω.

Changes

The manufacturer reserves the right to change the design and specification without prior notice.

When ordering Spare Parts

Please always state Part No, description, model and series.

Safety information

ESD warning

The receiver contains components that are sensitive to electrostatic discharge (ESD).
Any servicing or repair work must therefore be done in such a way that the components are not subjected to ESD.

Safety components

Components marked with the symbol ! in the schematic diagram are critical for safety. These must only be replaced with the corresponding component on the basis of article number. All PCBs are also safety components.

Safety check after service

Check carefully that all cables are properly plugged into the correct connectors.

Component references

Each component has a reference consisting of letter(s) and number(s) (e.g. IA11).
The first letter indicates the type of component (I = integrated circuit).
The second letter indicates the circuit board or block to which the component belongs (A = audio block).

Component type	PCB / block
A Crystal	**A** Audio block
C Capacitor	**B** LNB supply
D Diode	**C** Control block
F Fuse	**E** Control block
I Integrated circuit	**F** Baseband block
J Jumper	**G** Video block
L Choke	**H** Polariser block / 0/12 block
R Resistor	**K** Control block
T Transistor	**P** Power supply unit
T Transformer	**U** Processor module
X Connector, Switch	
Z Filter,Crystal	

Oscilloscope pictures

Oscilloscope pictures for the mains side of the power supply are referred to the negative connection pin of CP 21.

Note! When measuring on the mains side of the power supply the receiver has to be connected to an isolation transformer.

Check carefully that all cables are properly plugged into the correct connectors.

Technical data

Product specifications

Transmission Standards

PAL	Modulator & TV,VCR SCART outputs
SECAM	Through SCART only
VideoCrypt 1	Built in decoder

Connections

LNB / Tuner input

Connector	2x F-type (LNB 1, LNB 2)
Input frequency	920-2150 MHz
Input level	-60 to -30 dBm
Supply voltage	13,5 /18,5 V ±5%
Max. current	500 mA, overload protected
Control voltage	22 kHz, 0,5 V_{pp}
RF impedance	75 Ω
IF frequency	479,5 MH
IF bandwidth	27 MHz
FM threshold	better than 6 dB (static)
AFC	± 8 MHz

TV Scart

Video output	1 V_{pp} (± 2 dB) / 75 Ω
Video bandwidth	0 ... 5 MHz (+1/-3 dB)
Audio output	0,5 V_{rms} / R_L 10 kΩ
Audio bandwidth	40 Hz .. 15 kHz (±1,5 dB)
RGB output	From decoder Scart
Fast blanking output	From decoder Scart
Status output	0/6/12 V / R_L 10 kΩ

VCR Scart

Video output	1 V_{pp} (±2 dB) / 75 Ω
Video bandwidth	0 .. 5 MHz (+1/-3 dB)
Video input	1 V_{pp} / 75 Ω
Audio output	0,5 V_{rms} / R_L 10 kΩ
Audio input	0,5 V_{rms} / R_L 10 kΩ
Status input	0/6/12 V / R_L 10 kΩ

Decoder Scart

Video/baseb. output	1 V_{pp} (±2 dB) / 75 Ω
PAL baseb. bandwidth	5 Hz .. 8,5 MHz (+1/-3 dB)
Video input	1 V_{pp} / 75 Ω
RGB input	Direct to TV Scart
Fast blanking input	To TV Scart, but switched off in TV-release, menu and VCR playback modes
Audio output	0,5 V_{rms} / R_L 10 kΩ
Audio input	0,5 V_{rms} / R_L 10 kΩ
Status input	0/6/12 V / R_L 10 kΩ

Audio L R

Connector	2 x RCA (L+R)
Output	0,5 V_{rms} / R_L 10 kΩ
Tuning	PLL
PLL tuning	10 kΩ steps
IF bandwidth	150 / 330 kHz
De-emphasis	Panda, 50µs, J17
Bandwidth	40 Hz .. 15 kHz (±1,5 dB)
Panda Stereo deviation	± 50 kHz
Stereo/dual sound	180 kHz carrier distance (parallel tuning)

Freq synth RF modulator

Input connector	IEC female
Output connector	IEC male
Output level	70 ± 5 dB µV
Output channel	UHF CH 21 - 69
Preset channel	39
Standard	PAL I

MAGN POL(ariser) interface

Connector	Push terminal
Current	± 60 mA

IR-link interface

Connector	Push terminal

ACU / VCR CONTROL

Connector	RCA

0/12 VOLT

Connector	RCA
Output	0/12 V /50 mA

Front panel

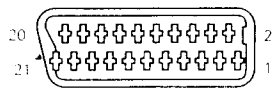
Front panel, display	3 numeric displays
Front panel, buttons	⏻, ▼▲

General

Article code	The articel code and model number is located on a label on the underside of the housing.
Supply voltage	230 V AC ±15%, 50-60 Hz
Power consumption	max 25 W
Power consumption in standby	2 W
Working temperature	+5° C to +40°
Storage temperature	- 40° C to +65° C
Operating distance for remote control	max 10 meters
Dimensions (w x d x h)	380 x 240 x 65 mm
Weight	1,9 kg approx

SCART-sockets

	TV	DECODER	VCR
1	Audio out right ch.	Audio out right ch.	Audio out right ch.
2	-	Audio in right ch.	Audio in right ch.
3	Audio out left ch.	Audio out left ch.	Audio out left ch.
4	Audio ground	Audio ground	Audio ground
5	RGB blue ground	RGB blue ground	-
6	-	Audio in left ch.	Audio in left ch.
7	RGB blue signal out	RGB blue signal in	-
8	Switch voltage out	Switch voltage in	Switch voltage in
9	RGB green ground	RGB green ground	-
10	-	-	-
11	RGB green signal out	RGB green signal in	-
12	-	-	-
13	RGB red ground	RGB red ground	-
14	Fast blank. ground	Fast blank. ground	-
15	RGB red signal out	RGB red signal in	-
16	Fast blanking out	Fast blanking in	-
17	Video out ground	Video out ground	Video out ground
18	-	Video in ground	Video in ground
19	Video out	Video out	Video out
20	-	Video in	Video in
21	Ground (casing)	Ground (casing)	Ground (casing)



The EMC Directive 89/336/EEC is applied to this product.

Service position

ESD warning

The receiver contains components that are sensitive to electrostatic discharge (ESD).

Any servicing or repair work must therefore be done in such a way that the components are not subjected to ESD.

Removing the circuit board package

1 Unscrew the screws on the sides of the receiver and the screws on the rear panel.
Lift off the cover.

2 Bend out the two catches on the side of the front panel. Pull the front panel from the bottom.

3 Unscrew the screws on the main board. Remove the cable fastening from the rear panel. Remove the main board.

Always place the main board on an ESD protection mat.

4 When appropriate, release the VideoCrypt module from the PCB. Unscrew the screw and turn the locking tabs with a pair of pliers. Lift the module upwards from the PC board distanse.

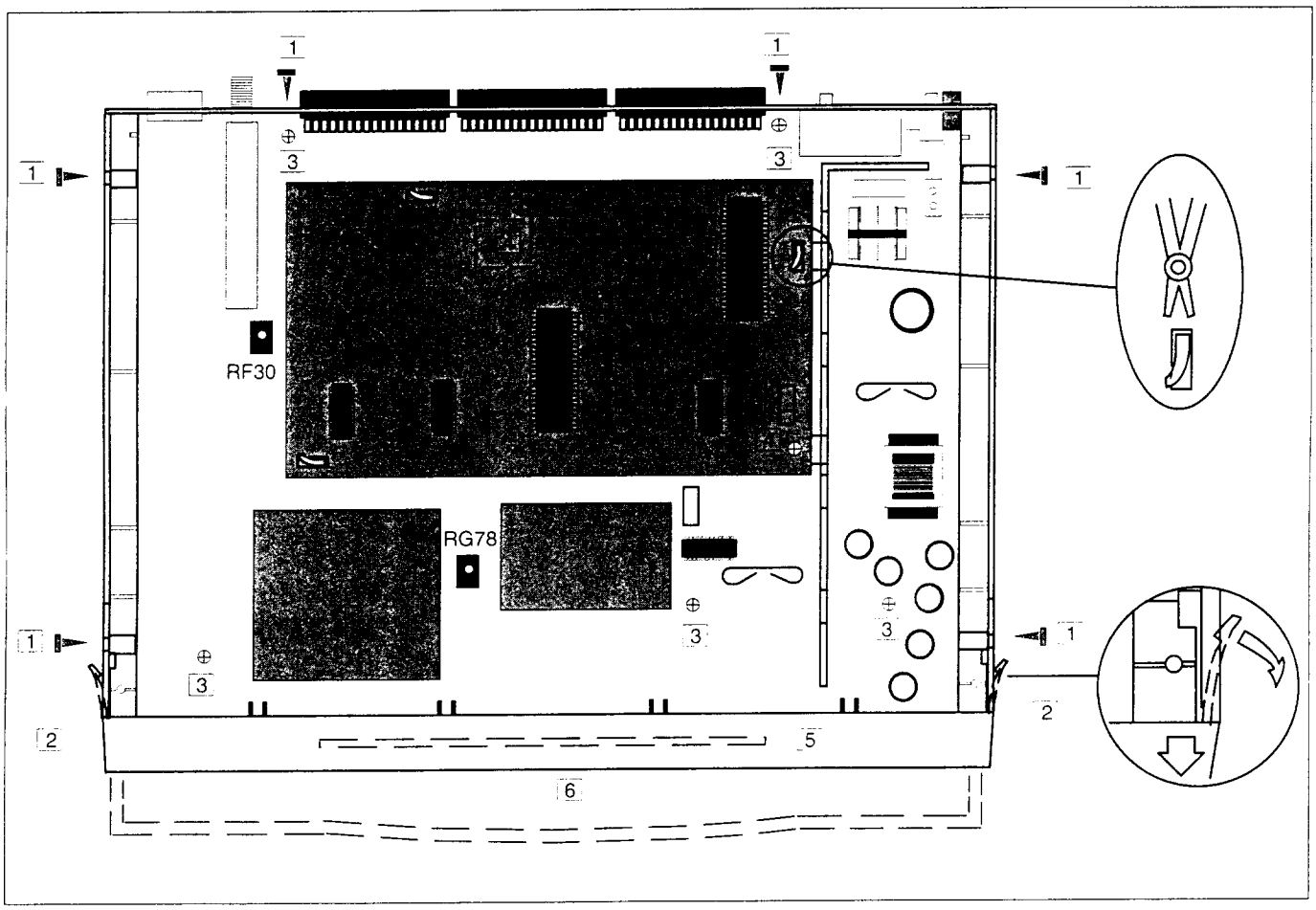
5 Dismantling the display window

Press the catches to the center of the window and press the window out of the frontpanel.

6 Dismantling the front lid

Turn the lid downwards and out of the locking pins.

Re-assemble parts in the reverse order.



Circuit description SAT 1800 IRD

Please refer to the block diagram for overall signal paths and CPU control. Please also use the circuit diagrams for details. This service manual also incorporates block diagrams for some individual IC.

Tuner

The tuner has the frequency synthesizer and AFC hardware circuits built-in, and is controlled by the CPU through the IIC-bus. AFC information from the tuner is sent to the CPU over the IIC bus, and the CPU sends tuning info over the IIC bus to the tuner.
The tuning info is transferred to a tuning voltage for the local oscillator, and the tuner keeps the requested frequency correct through its own PLL loop.
The tuning voltage is derived from the 30V supply rail. The tuner has two LNB inputs, selectable through the IIC bus.
The tuner is switched off in standby mode.

Video processing

The video processing block consists of baseband amplifiers, SECAM/PAL de-emphasis, video filter and dispersal clamping.
The filter LF15, CF27 and CF31 is a first video LP-filter (10 MHz) suppressing higher frequency components that otherwise might generate visible interferences in the video signal.
The amplifier stage TF19/TF11 is a high feedback two-transistor amplifier including a time constant in the feedback loop, providing MAC de-emphasis. Correct video level output is set by the potentiometer RF30.The baseband signal to the audio BP-filter is taken from the first amplifier stage.
The next amplifier stage TF17/TF13 is also frequency correcting, the two corrections together providing PAL deemphasis. RF29/CF53 and RF27/CF54 respectively limits the frequency response in the two amplifiers.
Video level selection Low/High is done with TF 20 (TF20 shortcircuits RF26 when conducting). Baseband signal for the decoder outputs is taken out from the voltage divider in the emitter of TF16 and routed to the video switch IG13.
TF16 also drives the video filter LF12/LF13, where all audio subcarriers and noise above 5 MHz is suppressed. CF17 and RF34 are a group delay compensation circuit, equalizing the time delay between the luminance and the chrominance. This compensation is necessary for some decoder systems like Nagravision and VideoCrypt.
TF21 is the driver stage for the clamping circuit TG11-TG13, for energy dispersal rejection. The syncpulse on the incoming video will be locked to a given DC level by TG11-TG13. TG12 is also acting as emitterfollower feeding the video switch IG13 and the VideoCrypt module with the CVBS signal.

Video switching and SCART circuits

IG13 (TEA 6415B) is a video matrix switch with 8 inputs and 6 outputs. To the inputs of TEA 6415B all video signals are routed: CVBS and PAL BB from the video process, CVBS from the VCR SCART, CVBS from the DECODER SCART, CVBS from the built in VideoCrypt decoder and from the OSD circuit. Outputs from IG13 are CVBS to the OSD circuit, CVBS or PAL BB to the DECODER SCART, CVBS to the VCR SCART, to the RF-modulator and to the TV SCART.
The video switch is controlled by the CPU over the IIC bus. Each video output has an emitterfollower as driver stage.

Audio processing

The audio processing block performs selection of the desired audio subcarrier(s), detection, Wegener Panda processing and audio switching for the different audio inputs/outputs.
The baseband signal from the first video amplifier passes through a band pass filter RA12/CA12/CA14/LA11/RA15/CA17, where the audio subcarrier signals within the 5 to 10 MHz band are filtered out and the video signal (especially the chroma part) is suppressed.
IA13 (TDA8745) is a combined frequency synthesizer, oscillator/mixer, audio detector and Panda sound processor in one IC. The frequency synthesizer part controls the oscillator through a PLL loop. The PLL loop filter CA25/CA30/RA19 is connected to pin 2. Tuning of the selected subcarrier is done through the IIC-bus from the CPU. The oscillator in TDA8745 is tuned by an internal capacitance diode.
On the output from the mixer (pin 5) is now available the desired subcarrier shifted up to 10,70 MHz (and 10,52 MHz in case of a stereo pair). These frequencies are filtered out by ZA11/ZA12 (or, in case of a mono subcarrier, the wide band filter ZA13) and routed back to the FM detectors.
After detection, the Wegener Panda 1 processing is automatically performed inside IA13 on all applicable signals. IA13 incorporates a source switch where selection of mono or stereo audio is done. The audio system selection is done through the IIC bus.

Audio SCART circuits

In addition to TDA8745,s built-in audio switches, one CD 4052 (IA11) stereo audio switch is used. The stereo output on pins 30/33 from TDA8745 is fed directly to the DECODER SCART and to CD4052.
To CD4052 is also routed audio from DECODER and VCR. The audio selected by CD4052 is routed to the VCR and to the EXTERN input of TDA8745. This switch can select between EXTERN and the TDA8745 internal audio. The stereo outputs from TDA8745 are routed to the TV SCART and the mono output drives the RF-modulator.
TDA8745 is powered also in standby, since the signals from the VCR SCART must be fed to the TV-SCART in standby for VCR play-back. The HiFi output carries the same audio signal as the TV SCART.
Status switching is controlled by the CPU. For the DECODER and the VCR SCARTs, separate ports on the CPU is used for identifying 6 or 12V signalling (indicating 16/9 respectively 4/3 picture format). The CPU can then signal either 6 or 12V to the TV-SCART. FB (Fast Blanking, to set the TV set in RGB mode) is transferred from DECODER SCART to the TV SCART trough TC12, defeating FB in TV-release and VCR playback modes.

OSD generator

The sync separation, sync generation and OSD generation is done in IF16, STV5730.
The circuit operates in two different modes: Full Page Mode (white text on blue background) which is used for all menus. For program info at program changes and for parameter adjustment in the channel programming mode, STV5730 operates in Mixed Mode (white text on video background). Programme guides use video Full page mode if TV sync is not present.

In Mixed Mode, a portion of the incoming video is added to the text, to avoid interrupting the chroma signal to the TV sets chrominance FM detectors when receiving a SECAM signal. Otherwise heavy colour noise will appear after each character. OSD text is connected to the TV-scart and RF-modulator outputs only (this is to avoid unintended VCR recordings of the menu). In normal mode of operation, the OSD generator is by-passed by the video switch.
For Full Page Mode operation, STV5730 has a crystal oscillator running at 4 times the colour subcarrier frequency (= 17,73 MHz). Both colour and sync are generated from this clock signal. The frequency is factory adjusted to nominal PAL colour subcarrier frequency.
For Mixed Mode operation, a PLL (phase locked loop) locks an internal oscillator to the incoming horizontal frequency, in turn synchronizing a pixel clock.
RG31, CG19 and CG20 is the PLL loop filter. The video input is buffered with TG34. The IC has a built-in clamping of the incoming video. The generated chrominance (background) and luminance (text) signals are filtered outside the IC, to improve the character appearance. These filters are RG96, CG40, CG43 and LG12 for the chrominance and RG95, CG44, LG13 and CG45 for the luminance respectively.
These signals are routed back to STV5730, where they are matrixed together to form the CVBS signal available on pin 27. The bypassed portion of the incoming video on pin 26 is added in the resistor matrix RG25, RG28 and RG84. CG16 increases the chrominance bypass level, to make sure that a SECAM TV will not be disturbed.
The character luminance level is controlled by the voltage divider RG21 and RG35. The proper background luminance level in Full Page Mode is set by the potentiometer RG78. To lower the background brightness in Radio Mode, the G and B-signals (pin 15 and pin 16) are connected to pin 23 via RG30 and RG32.
All CPU control is done over the IIC bus.

CPU

The CPU controller IU01 (MC68HC05E0) together with the EPROM IU02 for the software program, the shift register IU03, the calendar IC IU04 and the reset IC IU05 is placed on the CPU module.
The reset circuit MAX809L operates on the 5V supply. 140-560 ms after the "5V" reaches 4,63V, the reset IC output goes high, releasing the CPU. During power down, the reset signal goes low again at 4,63V.
The CPU itself runs on a 4 MHz clock (derived from the 8 MHz quartz oscillator), and supplies the 4 MHz clock for the audio processor TDA8735 through a separate output.
The shift register IU03 together with the resistor network RU03 D/A converts the polariser setting into an analogue control voltage.
The calendar IC IU04 (M8716B) retains its operation for at least 5 hours after power loss through the high capacitance electrolytic capacitor CU07. The IC contains a digital clock with a 32 kHz quartz oscillator and an IIC-bus interface to the CPU. The circuit is programmed to count seconds, minutes, hours, days and month.
The EEPROM IC13 (placed on the main board) is used for storing information to programme number, for service mode settings and for storing audio frequencies to audio system numbers. It retains all information independent of the power supply.

The IR remote control system is based on carrier coding (Nokia concept). The integrated IR diode and decoder IK13 converts the IR energy from the transmitter into voltage pulses which is software decoded in the CPU. To protect the IR processing from electromagnetic fields that can interfere with the IR decoding, IK13 is internally shielded.
The receiver has 600 programme places in total, hence three numerical characters are used. The display digits are time multiplexed.
The multiplexed display segments create a 53,3 Hz current ripple on the 5V supply, which can create interference in particular in the audio. This is avoided by the circuit TK19)/ TK23, which is a shunt regulator keeping the load on the 5V supply constant.
The shift register IC21 is a port expander to the CPU, loaded with data through the IIC-bus when the strobe line SREG STR is active.

Polariser control

The polariser circuit is a current generator keeping the polariser current constant and thus unaffected by the temperature dependent resistance of the polariser. The first half of IH11 (L2724) is a voltage amplifier controlled by the CPU through the resistive network RH22, RH 39 and RH41 which restricts the control voltage range to give +/- 60 mA current out. Pin 9 is the reference voltage (5,3V) from the voltage divider RH44/RH49.
The second half of L2724 is an OP amplifier whose reference voltage is derived from the output of the first OP amplifier through the resistive network RH29/RH40. If the control voltage at pin 8 is exactly 5,3V = reference, then the voltage on pin 1 will also be 5,3V as will the input on pin 7 of the second amplifier. As long as an OP amplifier is within its linear operating range, the system will settle so the two inputs have the same voltage. Hence the voltage on pin 6 must be 5,3V also, meaning that no current can flow through the resistor RH27. If the CPU shifts the control voltage from this equilibrium, the reference voltage on pin 7 will change as must the voltage on pin 6. The second amplifier will now either supply current through RH27 (and thus through the polariser output) or drain current through RH27 depending on the sign of the control voltage shift.
The transistor TH15 will conduct if the current through resistor RH28 increases above about 200 mA, triggering reset of the CPU in case of a short circuit to ground of any of the polariser output branches.

Power supply

The power supply is a flyback mode converter, operating at 100 kHz fixed frequency.
The filter section CP20/LP16/LP18/LP17 limits the RF interference level injected into the mains, and increases the input immunity to conform with existing EMC regulations.
The 185 to 275 Vrms AC input is rectified by the bridge DP19, DP20, DP24 and DP25 to a 250-380 Vdc over CP21.
The power MOSFET TP11 (TOP201) has all starting, control and protection circuitry built-in. A rectifier DP34 provides a supply voltages for the optocoupler, controlling the primary pulse width.
The control pin 1 (Vc) of TP11 is the bias for the controller and driver circuitry. Vc is regulated in either of two modes of operation. Hysteric regulation is used for initial start-up and overload operation. Shunt regulation is used to separate the duty cycle error signal from the control circuit supply current.

During start-up, Vc current is supplied from a high-voltage switched current source connected internally between the drain and control pins, please see TP11 block diagram.
First time Vc reaches the upper threshold (approx. 5,7 V), the high voltage source is turned off and the PWM modulator and the output MOSFET transistor are activated.
When the output voltages are regulated, feedback control current supplies the Vc supply with current and the shunt regulator keeps Vc at typically 5,7 V.
If the control pin external capacitance CP31 during overload should discharge to the lower threshold 4,7 V, then the output transistor is turned off. The hysteric auto restart comparator keeps Vc within a window of typically 4,7 to 5,7 V by turning the high voltage current source on and off. This keeps the duty cycle low and also limits the power dissipation. Auto restart continues to cycle until the overload is removed and the output voltage regulation is again achieved.
The output overvoltage protection latch is activated by a high current pulse into the control pin. When set, the latch turns off the control circuitry and the output transistor. To resume normal operation the input power must be removed and restored.
The secondary output rectifiers delivers 12V, 24V, 18V and 5V outputs. 30V for the tuner is created by the voltage adder circuit CP14/DP14/DP15/LP12/CP16 and the zener diode stabilizer RP14/DP16.
The voltage controlled current generator IP13 keeps the output voltages within close tolerance through the action of the opto coupler IP12.
The receiver has a low power standby mode (approx. 2W), through the transistor switches TP13 and TP30.
LNB overload protection is done through the IB01 circuitry. The LNB supply windings of TP01 are separated from the other outputs, and the LNB currents are measured over resistors RP26 and RP38. Overload will cause the output transistor in the comparator IB01-2 conduct, resetting the receivers CPU, which switches the LNB outputs to off. Sustained overload will force the receiver into an intermittent operation, keeping the LNB current to a safe level. Normal operation is achieved when the overload is removed.

LNB voltage supply

To minimize the power loss in the LNB supply, the main power supply provides two voltages for the LNB stabilizer, 18V and 24V. TB11 is conducting for 18,5V LNB out, back polarizing DB32 and thus disconnecting the 18V rail. To further lessen the temperature in the linear stabilizer IB11, three series resistors RB65-RB67 dissipates part of the power at 18,5V output.
For 13,5 V LNB output, TB11 is switched off and IB11 is now fed from the 18V supply through DB32.
The voltage between the output pin 2 and the reference pin 1 is internally controlled in IB11 (1,25V). The 18,5V output is therefore determined by the voltage divider RB12, RB20;
The output voltage can be adjusted by changing RB24. To give 13,5V output, RB23 is connected to ground when TB19 is conducting (and at the same time switching off TB11).
The comparator IB01-1 is a 22 kHz square-wave oscillator. Its output is pulse-formed to a specified rise- and fall-time by RB37/CB15, and fed to the reference terminal of IB11. This will give a stable and interference-free control signal added to the LNB voltage, for LNB switching.
The LNB supply is connected to either LNB1 or LNB2 output through the switches TB12 and TB15. For certain SMATV installations the software can disable both TB12 and TB15 simultaneously.

Adjustments in service mode SAT 1800 IRD

Introduction

The satellite receiver is controlled by the processor IU01, MC68HC05 E0, on the processor board.
Everything in this receiver concerning IR-decoding and tuning control is controlled by the processor.
In the service mode it is possible to set various parameters which are not accessed by the user.
All adjustments shall be carried out with 220 / 240 V mains voltage.

Service mode

Connect the receiver to a TV set.
Enter service mode by rapidly pressing the following buttons on the remote control in the order shown below:

That you have reached the service mode is indicated by "**d - -**" on the receiver's display, and by the following menu on the TV screen:

The digits on the first line e.g.17:10 is a PDC/VPS clock time and indicates that a PDC/VP signal is beeing received. Digits 31:63 indicates that no PDC/VPS signal is received.

Memory dump

This mode is automatically selected immediately after entering service mode.
Shown by "**d - -**" on the display and Memory dump "**- -**" on the TV's menu.
All information stored in a "master" receiver can be transferred to a second receiver.

The different copy functions are shown on the display and on the TV screen:
"drE", Rec = dump receiving mode
"ALL", All = dump the whole EEPROM content
"Chn", Ch = dump the channel information

Dumping procedure

1. Connect a SCART cable from the **master** receiver's **TV** SCART to the **second** receiver's **VCR** SCART.
2. Start the two receivers.
3. Enter Service mode on both receivers.
   "**d - -**" are displayed on the two displays.
4. Press the "▲" button on the front panel on the **master receiver** to select "**ALL**" or "**Chn**".
5. Then press the "▲" button on the front panel on the **second receiver**. "**drE**" is indicated on the display.
6. Press **OK** on the remote control. Both receivers are activated and the dump procedure starts. One segment on the display is rotating on both receivers.
7. When "**ALL**" or "**Chn**" is indicated on the master receiver's display again and "**drE**" on the second receiver, the "dump" is ready.
8. Press ⏻ to return to standby.
   Remove the SCART cable.

Sounds adj. from

The frequencies in the last audio channels 20 - 32 can be adjusted. The parameter is set to 20 in the factory. Adjust with the ▼ ▲ buttons on the remote control.

Installation option

Adjust with the ▼ ▲ buttons.
1 = Yes / On

- Read DECp8 = Decoder automatic recognition
- Read VCRp8 = VCR automatic recognition
- AntPowEna = LNB power enable
- TVauto = Pin 8 to TV enable
- OEMRC = Remote control type, buttons will be rotated 90° (not used)
- ModSysG = Modulator type BG / I

Factory Option

From factory the options are preprogrammed 01000010.

7 5 3 1

0 1 0 0 0 0 1 0

6 4 2 0

You alter the option code between 0 and 1 by pressing the corresponding number button (0 - 7) on the remote control:

1 = Yes/On, 0 = No/Off

0. "Welcome menu" after power on (first time use)
1. SAT 1800 IRD (Internal VideoCrypt decoder)
2. Selectable tuner BW (band width)
3. Selectable TV system
4. C and S band selection enabled
5. Global inverting of the BW selection
6. Do not go to " Country" and "Language" menus after "OK" in "Welcome" menu.
7. Not used

Store

Store all new settings by pressing the **OK** button.

Leave service mode

You leave the service mode by pressing the **TV/SAT** button.

Sound channel locations

Use this table to locate sound channels if you have difficulty receiving good quality sound output from your receiver.

Audio ch.	Frequency Stereo MHz CH L	CH R	Mono MHz	Band-width kHz	Deemp-hase	Notes
1	6.30	6.48		150	Panda 1	Fixed frequencies.
2	6.66	6.84		"	"	" ASTRA universal
3	7.02	7.20		"	"	" audio system
4	7.38	7.56		"	"	" "
5	7.74	7.92		"	"	" "
6			6. 50	330	50µs	"
7			6.60	"	"	"
8			6.65	"	"	"
9			5.80	"	J17	"
10			6.30	150	Panda 1	" ASTRA universal
11			6.48	"	"	" audio system
12			6.66	"	"	" "
13			6.84	"	"	" "
14			7.02	"	"	" "
15			7.20	"	"	" "
16			7.38	"	"	" "
17			7.56	"	"	" "
18			7.74	"	"	" "
19			7.92	"	"	" "
20	6.12	6.30		150	Panda 1	Possible to change
21	7.56	7.74		"	"	the frequencies
22	7.92	8.10		"	"	"
23	8.10	8.28		"	"	"
24			6.80	330	50µs	"
25			7.20	"	"	"
26			6.40	"	J17	"
27			7.25	"	"	"
28			7.75	"	"	"
29			8.65	"	"	"
30			6.12	150	Panda 1	"
31			8.10	"	"	"
32			8.28	"	"	"

ACU positions

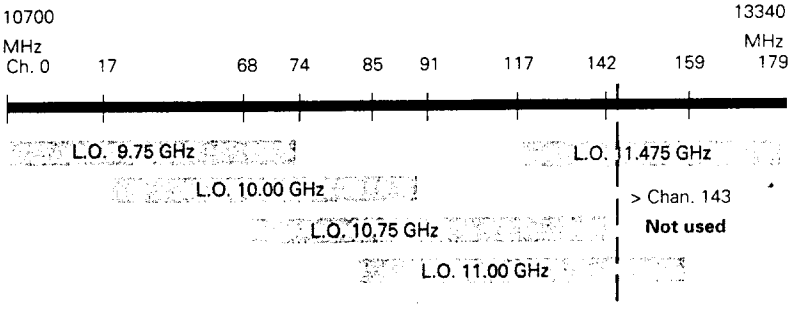
Use this table to locate ACU positions for various satellite blocks

ACU pos.	Block name	
1	ASTRA	GER
2	ASTRA	GB
3	ASTRA	F
4	ASTRA	NL
5	ASTRA	ESP
6	ASTRA	SCA
7	ASTRA	MISC
8	EUTELS	13E
9	HOTBIRD	13E
10	EUTELS	16E
11	EUTELS	10E
12	EUTELS	7E
13	SIRIUS	5E
14	TELE-X	5E
15	TCOM-1C	3E
16	INTELS	1W
17	THOR	1W
18	TV-SAT	1W
19	TCOM-2B	5W
20	TCOM-2A	8W
21	STATS	11W
22	INTELS	18W
23	TDF/2	19W
24	INTELS	21W
25	INTELS	27W
26	HISPAS	30W
27	PAS1	45W
28	INTELS	21E
29	KOPER2	28E
30	KOPER1	23E
31	ARABS1	31E
32	TURK1B	42E
33	INTELS	60E
34	INTELS	63E
35	INTELS	66E
36	TCOM	2AB
37	SAT-POS	A
38	SAT-POS	B
39	SAT-POS	C
40	SAT-POS	D

Channels and frequencies

Chan No.	Satellite frequency MHz	Chan No.	Satellite frequency MHz	Chan No.	Satellite frequency MHz
	KU-band		**KU-band**		**KU-band**
0	10 698,50	51	11 450,75	101	12 188,25
1	10 713,25	52	11 465,50	102	12203,00
2	10 728,00	53	11 480,25	103	12 217,75
3	10 742,75	54	11 495,00	104	12 232,50
4	10 757,50	55	11 509,75	105	12 247,25
5	10 772,25	56	11 524,50	106	12 262,00
6	10 787,00	57	11 539,25	107	12 276,75
7	10 801,75	58	11 554,00	108	12 291,50
8	10 816,50	59	11 568,75	109	12 306,25
9	10 831,25	60	11 583,50	110	12 321,00
10	10 846,00	61	11 598,25	111	12 335,75
11	10 860,75	62	11 613,00	112	12 350,50
12	10 875,50	63	11 627,75	113	12 365,25
13	10 890,25	64	11 642,50	114	12 380,00
14	10 905,00	65	11 657,25	115	12 394,75
15	10 919,75	66	11 672,00	116	12 409,50
16	10 934,50	67	11 686,75	117	12 424,25
17	10 949,25	68	11 701,50	118	12 439,00
18	10 964,00	69	11 716,25	119	12 453,75
19	10 978,75	70	11 731,00	120	12 468,50
20	10 993,50	71	11 745,75	121	12 483,25
21	11 008,25	72	11 760,50	122	12 498,00
22	11 023,00	73	11 775,25	123	12 512,75
23	11 037,75	74	11 790,00	124	12 527,50
24	11 052,50	75	11 804,75	125	12 542,25
25	11 067,25	76	11 819,50	126	12 557,00
26	11 082,00	77	11 834,25	127	12 571,75
27	11 096,75	78	11 849,00	128	12 586,50
28	11 111,50	79	11 863,75	129	12 601,25
29	11 126,25	80	11 878,50	130	12 616,00
30	11 141,00	81	11 893,25	131	12 630,75
31	11 155,75	82	11 908,00	132	12 645,50
32	11 170,50	83	11 922,75	133	12 660,25
33	11 185,25	84	11 937,50	134	12 675,00
34	11 200,00	85	11 952,25	135	12 689,75
35	11 214,75	86	11 967,00	136	12 704,50
36	11 229,50	87	11 981,75	137	12 719,25
37	11 244,25	88	11 996,50	138	12 734,00
38	11 259,00	89	12 011,25	139	12 748,75
39	11 273,75	90	12 026,00	140	12 763,50
40	11 288,50	91	12 040,75	141	12 778,25
41	11 303,25	92	12 055,50	142	12 793,00
42	11 318,00	93	12 070,25	143	12 807,75
43	11 332,75	94	12 085,00	144	. . . . .
44	11 347,50	95	12 099,75	. . .	
45	11 362,25	96	12 114,50	. . .	Not used
46	11 377,00	97	12 129,25	. . .	
47	11 391,75	98	12 144,00	. . .	
48	11 406,50	99	12 158,75	. . .	
49	11 421,25	100	12 173,50	. . .	. . . . .
50	11 436,00				

Channels covered by different LNB:s.

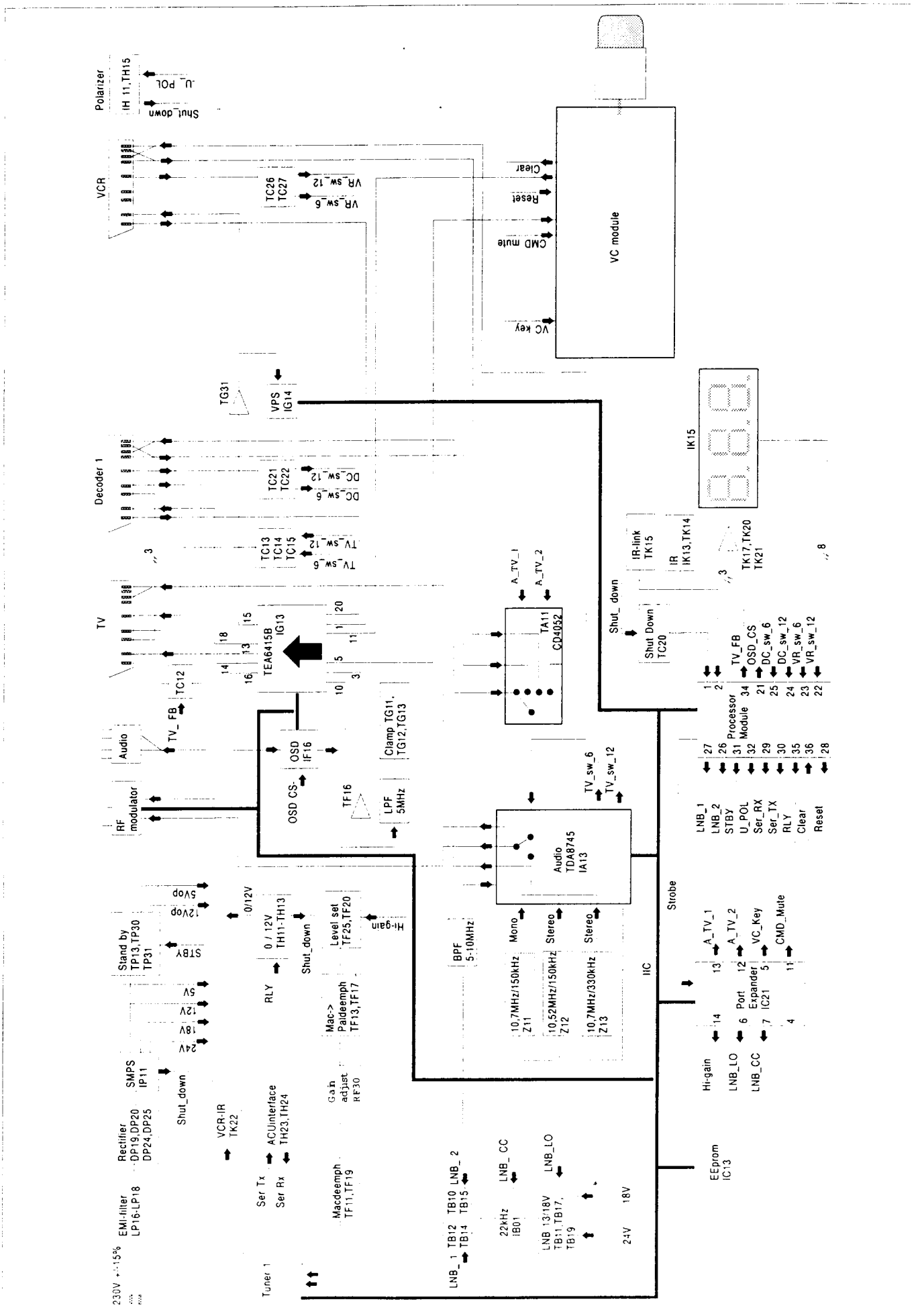


Brand Code List, Video Recorder

* If the brand has more than one code, start with the first code.

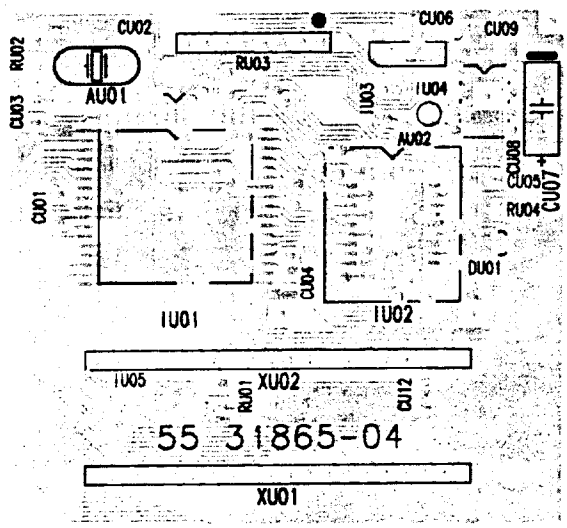
NOKIA *	**19**
NOKIA *	**20**
NOKIA *	**32**
NOKIA *	**03**
NOKIA *	**34**
NOKIA *	**35**
AIOSTAY *	26
AIOSTAY *	04
AIWA	01
AKAI	02
AKURA *	05
AKURA *	15
AMSTRAD	04
ANCORA	06
ANITECH *	12
ANITECH *	28
ANITECH *	03
ANSONIC	26
ATLANTIC	12
AUTOVOX	28
BASIC LINE	26
BESTAR	04
BLACK PANTHER *	03
BLACK PANTHER *	36
BLAUPUNKT *	28
BLAUPUNKT *	07
BONDSTEC	04
BRANDT	09
BRION VEGA	21
CGE	34
CONDOR *	03
CONDOR *	04
CONTINENTAL EDISON	01
CROWN	03
DAEWOO	03
DAYTRON	04
DUAL *	28
DUAL *	09
DUX	28
ELBE *	25
ELBE *	03
ELBE *	40
ELEKTRA	04
ELTA *	13
ELTA *	16
FENNER	04
FERGUSON	09
FIDELITY	04
FINLUX *	18
FINLUX *	28
FINLUX *	04
FIRST LINE	12
FISCHER	34
FTE	04
FUNAI *	15
FUNAI *	04
GBC	12
GENEXXA	04
GOLDSTAR	12
GRAETZ *	14
GRAETZ *	20
GRAETZ *	21
GRAETZ *	32
GRAETZ *	35
GRANDIN *	03
GRANDIN *	12
GRONIC	04
GRUNDIG *	16
GRUNDIG *	36
GRUNDIG *	06
GTT	20
HANSEATIC *	12
HANSEATIC *	26
HINARI	17
HITACHI	18
HYPSON	26
IMPERIAL *	12
IMPERIAL *	04
INNOHIT *	12
INNOHIT *	03
INNOHIT *	32
INTERBUY	12
INTERVISION *	28
INTERVISION *	03
IRRADIO *	12
IRRADIO *	20
IRRADIO *	28
NOKIA/ITT *	19
NOKIA/ITT *	20
NOKIA/ITT *	32
ITV *	03
ITV *	08
JVC *	01
JVC *	21
KATAI	26
KENDO	02
KENWOOD *	01
KENWOOD *	21
LENCO	03
LEYCO *	15
LEYCO *	04
LOEWE-OPTA *	12
LOEWE-OPTA *	28
LOEWE-OPTA *	09
LUMATRON	03
LUXOR	20
MATSUI	23
MARANTZ *	28
MARANTZ *	39
MARANTZ *	09
MEMOREX	38
METZ *	16
METZ *	27
MINERVA	16
MITSUBISHI	24
M-ELECTRONIC	01
NAKAMURA	04
NEC	25
NESCO	12
NORDMENDE *	09
NORDMENDE *	01
NORDMENDE *	06
OCEANIC	02
OCEANIC	20
OCEANIC	21
OCEANIC	35
OKANO	02
ORION	26
ORSON	04
PALADIUM *	02
PALADIUM *	32
PALADIUM *	04
PANASONIC *	27
PANASONIC *	26
PATHE MARCONI	06
PHILIPS *	28
PHILIPS *	09
PHONOLA	28
PIONEER *	28
PIONEER *	37
PRACISION	10
PROFEX *	13
PROFEX *	28
PROFITRONIC *	28
PROFITRONIC *	32
PROSONIC	04
RADIALVA	35
RADIOLA	28
RAFAL	12
REX	21
RFT *	15
RFT *	02
ROADSTAR *	12
ROADSTAR *	32
ROYAL	03
SABA *	01
SABA *	06
SABA *	09
SALORA *	02
SALORA *	20
SALORA *	24
SALORA *	34
SAMSUNG	32
SANSUI	40
SANYO	34
SCHAUB LORENZ *	02
SCHAUB LORENZ *	20
SCHAUB LORENZ *	34
SCHAUB LORENZ *	14
SCHNEIDER *	12
SCHNEIDER *	17
SCHNEIDER *	22
SCHNEIDER *	28
SCHNEIDER *	06
SCHNEIDER *	09
SEG *	01
SEG *	15
SEG *	02
SEG *	03
SELECO	21
SETRON *	01
SETRON *	40
SHARP	35
SHINTOM	03
SIEMENS *	12
SIEMENS *	16
SIEMENS *	23
SIEMENS *	28
SIEMENS *	30
SIEMENS *	34
SINGER	40
SINUDYNE *	26
SINUDYNE *	28
SONIC	03
SONOKO	03
SONOLOR	35
SONY	36
TANA	05
TEC	04
TELEAVIA *	06
TELEAVIA *	09
TELEFUNKEN *	06
TELEFUNKEN *	09
TELETECH	15
TELEVIDEON	12
TENSAI *	12
TENSAI *	04
TENSAI *	06
THOMSON *	01
THOMSON *	06
THOMSON *	09
TOKAI	12
TOSHIBA *	24
TOSHIBA *	40
TOWADA	03
UHER *	12
UHER *	32
UNIVERSUM *	12
UNIVERSUM *	16
UNIVERSUM *	02
UNIVERSUM *	26
UNIVERSUM *	28
UNIVERSUM *	32
UNIVERSUM *	04
UNIVERSUM *	09
VCRI INTERNATIONAL	33
WELTBUCK	12
WESTINGHOUSE	12
YOKO	12
ALL OTHER BRANDS	**00**

Blockdiagram

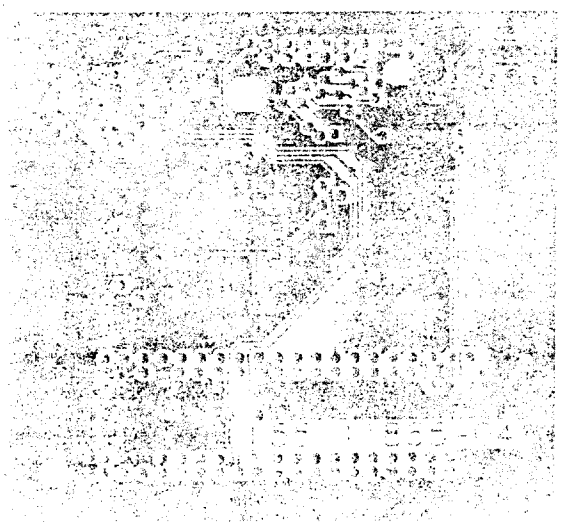


Processor module

Spare part list page 22 Processor board No: 6913 67 04



Component side

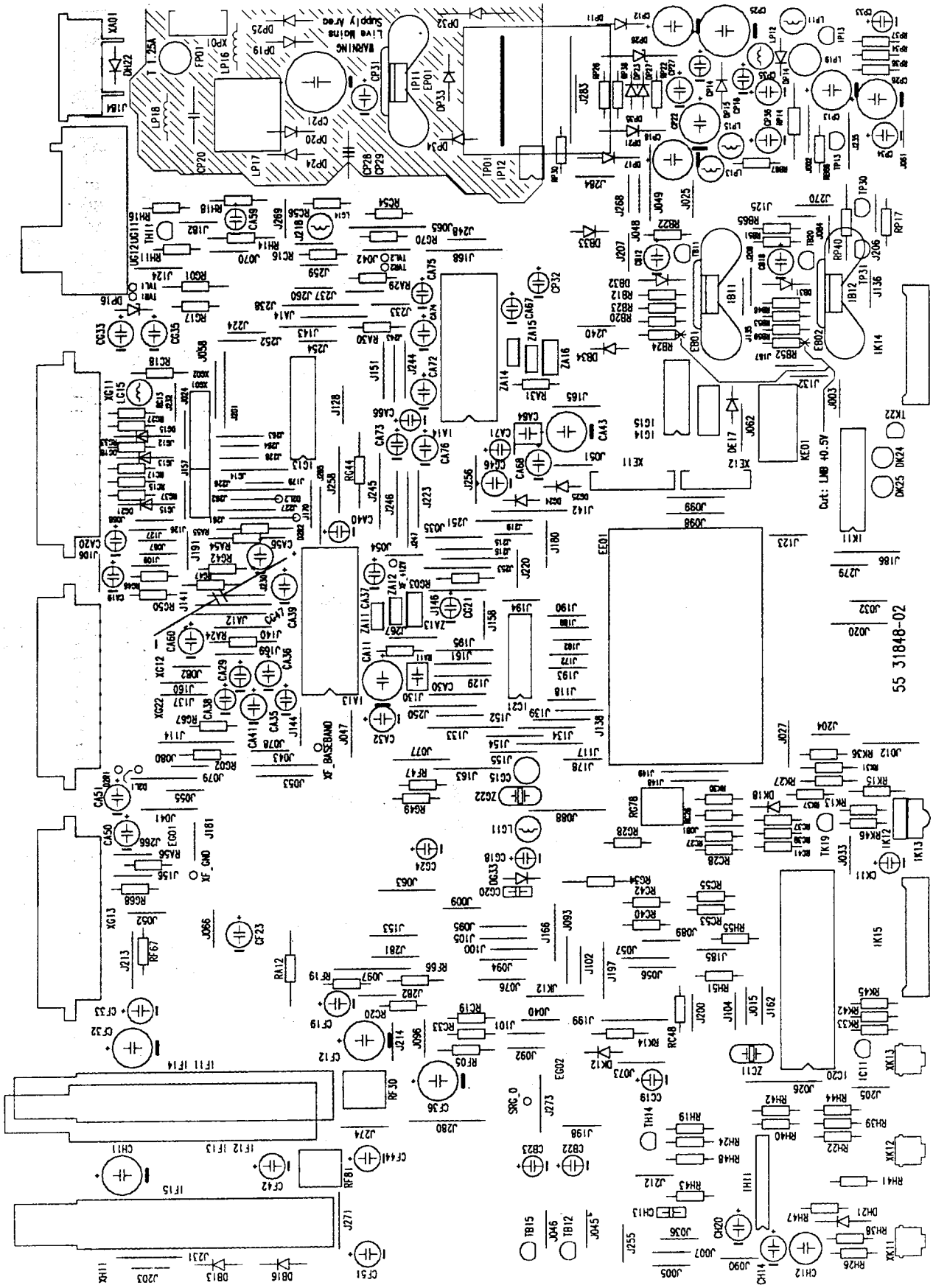


Printed side

Main P.C board

Spare part list page 19

P.C. board No: 6913 68 62

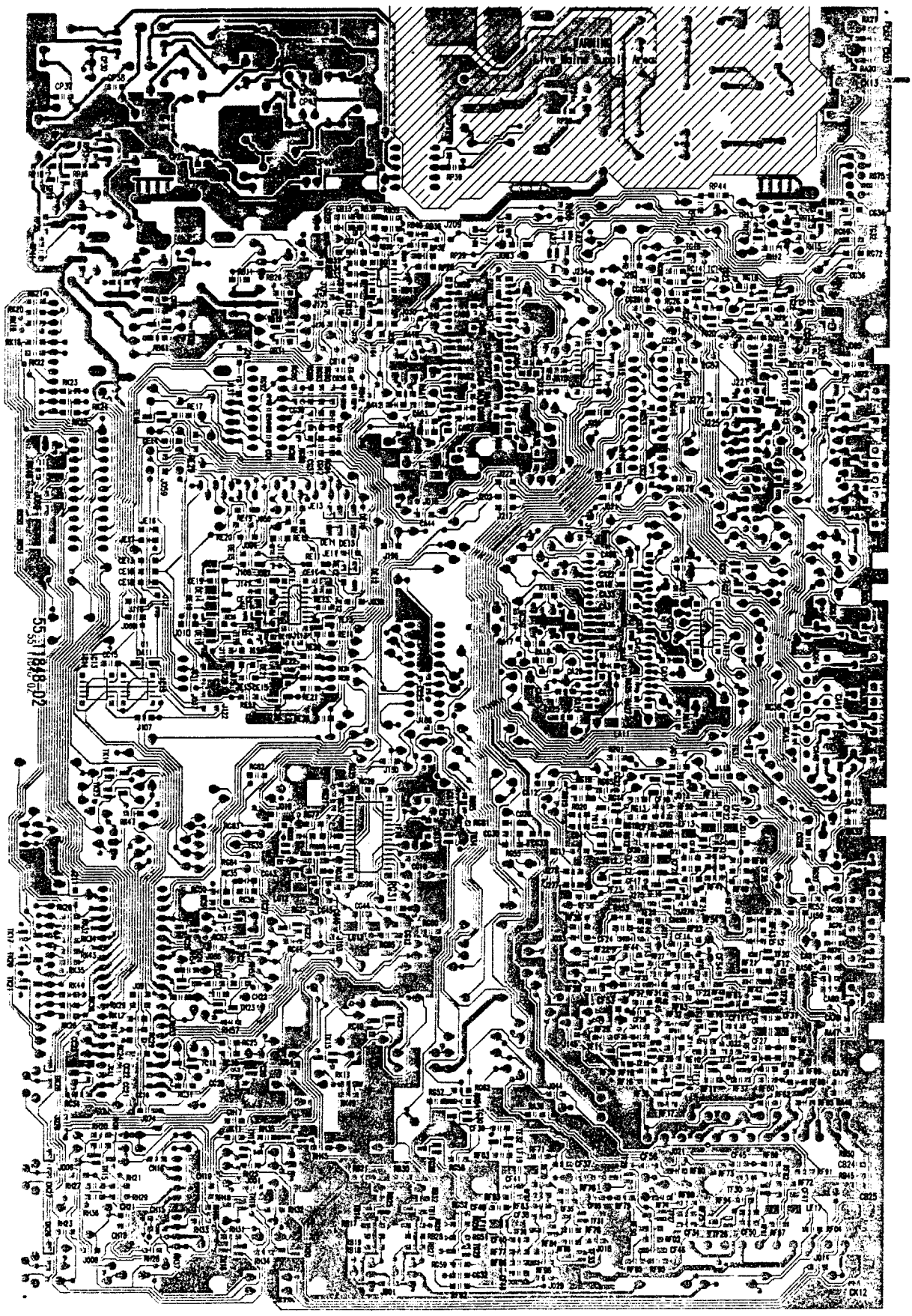


Component side

Main P.C board

Spare part list page 19

P.C. board No: 6913 68 62

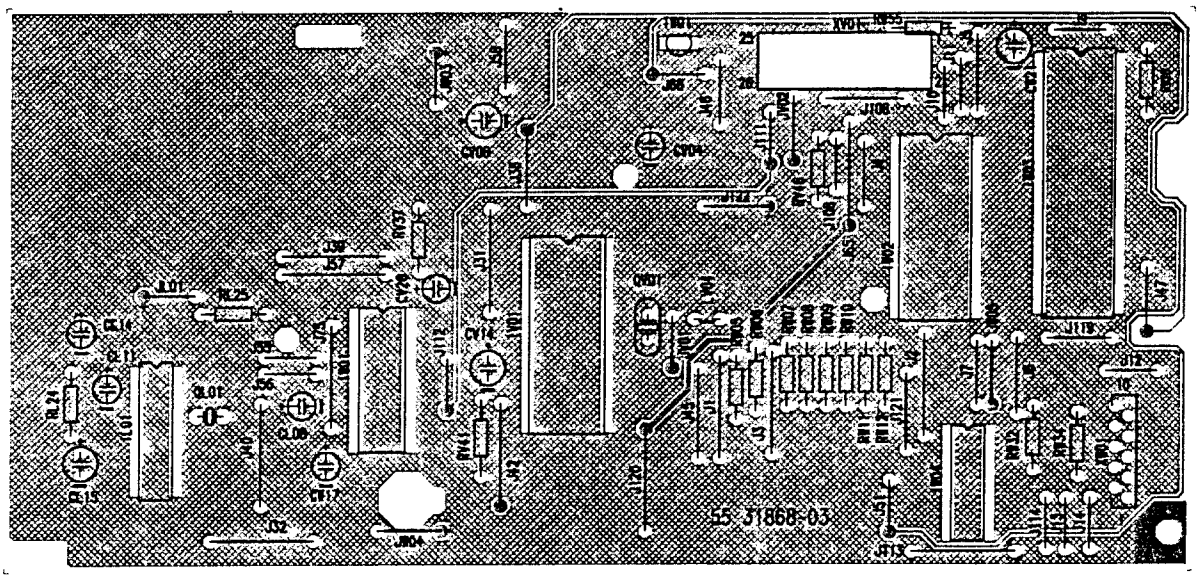


Printed side

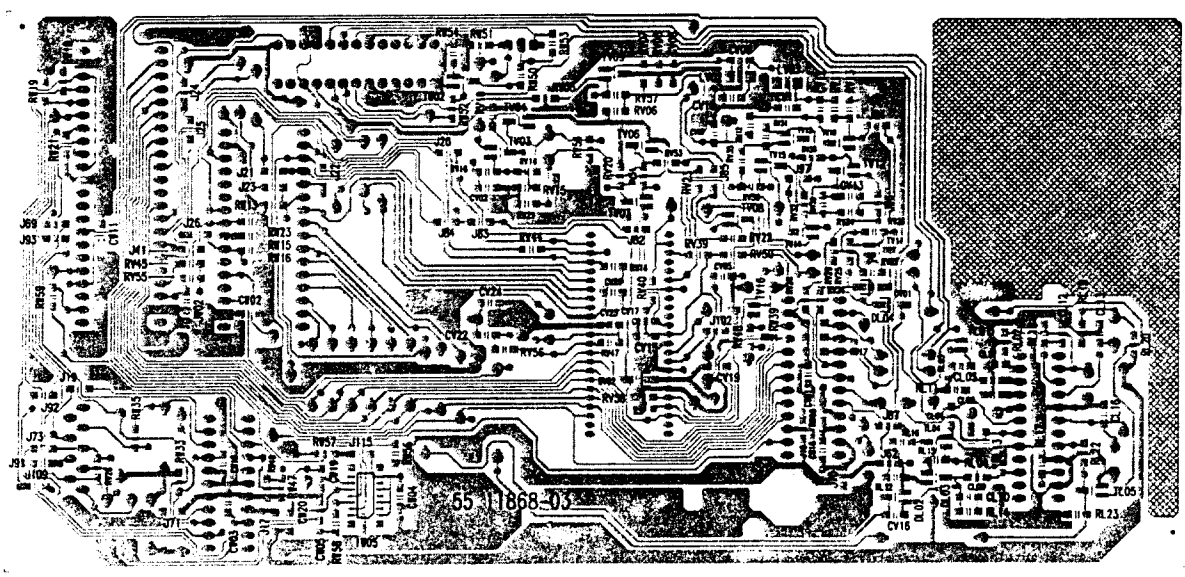
VideoCrypt module

Spare part list page 22

VC board No: 6913 68 64



Component side

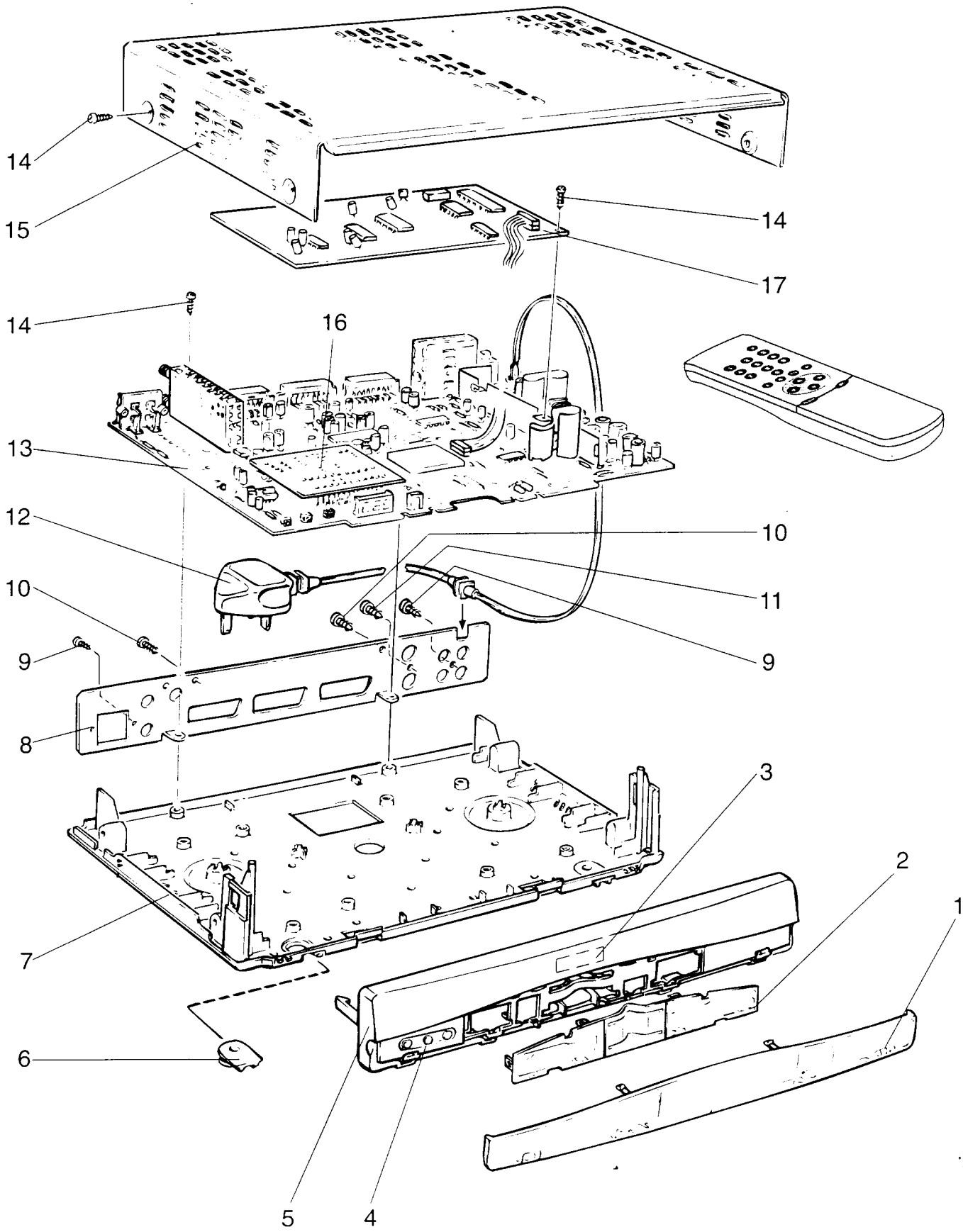


Printed side

Exploded view

Satellite Receiver SAT 1800 IRD

(Spare parts see page 19)



Spare parts for 262 5957-XX SAT 1800 IRD

Position	Parts No	Description	Remarks
1	6136 1439	Flap control unit	
2	6466 0296	Window display	
3	6622 8814	Brand NOKIA	
4	6328 0493	Keypad	
5	6418 4227	Front	
6	6273 4061	Foot	
7	6134 5394	Cabinet bottom	
8	8681 7534	Rear panel	
9	8681 5246	Screw Torx PT-K 30x10	
10	8681 7542	Screw Torx RTS ST 3,5x9,5	
11	8681 7543	Screw Torx RTS 3,5 x 6,5	
12	4131 4370	Cable net UK	
13	6913 6862	Main board	
	6913 6874	Main board	From w 22/96
14	8681 5244	Screw Torx PT-K 35x10	
15	6134 5419	Cover, grey	
16	6913 6704	Processor module	
17	6913 6864	VideoCrypt module	
Bypacked			
-	5652 2345	Remote control SCN620	
-	5652 2444	Remote control Nokia	From w 35/96
-	4424 8802	Battery 1,5 V R03	
-	4131 4372	Antenna cable 1,5 m	
-	6612 7858	Instruktion manual GB	
-	6612 7783	Programme guide	
-	6612 7814	Programme guide	

Main board 6913 6862, 6913 6874

Capacitor			
CA11		ECAP 470 UF 16 V	STANDARD
CA12	3385 9049	CAP 56 PF 50V CHIP	
CA14		CAP 120 PF 50V SMD	STANDARD
CA16		CAP 220 NF 25V SMD	STANDARD
CA17		CAP 27 PF 50V SMD	STANDARD
CA18		CAP 220 NF 25V SMD	STANDARD
CA19, 20		ECAP 22 UF 16 V	STANDARD
CA21, 22		CAP 220 NF 25V SMD	STANDARD
CA23, 24	3385 9045	CAP 4.7NF 50V CHIP	
CA25		CAP 33 NF 50V SMD	STANDARD
CA26	3385 9043	CAP 10NF 50V SMD	
CA29	3422 0224	ECAP 1.0UF 20% 100V	
CA30	3422 0173	ECAP 1 UF 50 V	
CA31	3385 9043	CAP 10NF 50V SMD	
CA32		ECAP 10 UF 35 V	STANDARD
CA33	3385 9045	CAP 4.7NF 50V CHIP	
CA34	3385 9043	CAP 10NF 50V SMD	
CA35		ECAP 2,2 UF 100 V	STANDARD
CA36		ECAP 10 UF 35 V	STANDARD
CA37, 38		ECAP 2.2 UF 100 V	STANDARD
CA39		ECAP 10 UF 35 V	STANDARD
CA40	3422 0224	ECAP 1.0UF 20% 100V	
CA41		ECAP 10 UF 35 V	STANDARD
CA42	3385 9045	CAP 4.7NF 50V CHIP	
CA46, 48	3385 9045	CAP 4.7NF 50V CHIP	
CA50, 51		ECAP 10 UF 35 V	STANDARD
CA59		ECAP 22 UF 16 V	STANDARD
CA78, 80	3385 9045	CAP 4.7NF 50V CHIP	
CA83, 88	3385 9048	CAP 100NF 50V CHIP	
CB12		ECAP 47 UF 50 V	STANDARD
CB15	3385 9045	CAP 4.7NF 50V CHIP	
CB16		CAP 150 PF 50V SMD	STANDARD
CB20	3385 9048	CAP 100NF 50V CHIP	
CB22	3422 0224	ECAP 1.0UF 20% 100V	
CB23	3422 0224	ECAP 1.0UF 20% 100V	
CB24, 25	3385 9043	CAP 10NF 50V SMD	
CC15, 16	3385 9048	CAP 100NF 50V CHIP	
CC19		ECAP 22 UF 16 V	STANDARD
CC20	3385 9048	CAP 100NF 50V CHIP	
CC25	3385 9048	CAP 100NF 50V CHIP	
CF11	3385 9048	CAP 100NF 50V CHIP	
CF12		ECAP 470 UF 16 V	STANDARD
CF13		CAP 22 PF 50V SMD	STANDARD
CF14	3385 9048	CAP 100NF 50V CHIP	
CF15		CAP 100 PF 50V SMD	STANDARD
CF16	3385 9049	CAP 56 PF 50V CHIP	
CF17		CAP 220 PF 25V SMD	STANDARD
CF18		CAP 220 NF 25V SMD	STANDARD
CF19	3422 0228	ECAP 100UF 20% 25V	
CF23		ECAP 47 UF 50 V	STANDARD
CF24	3385 9082	CAP 390 PF 50V SMD	
CF26		CAP 150 PF 50V SMD	STANDARD
CF27		CAP 10 PF 50V SMD	STANDARD
CF28		CAP 120 PF 50V SMD	STANDARD
CF30		CAP 39 PF 50V SMD	STANDARD
CF31		CAP 22 PF 50V SMD	STANDARD
CF32		ECAP 470 UF 16 V	STANDARD
CF33	3422 0228	ECAP 100UF 20% 25V	
CF53, 54		CAP 100 PF 50V SMD	STANDARD
CG11 - 13	3385 9048	CAP 100NF 50V CHIP	
CG14		CAP 39 PF 50V SMD	STANDARD
CG15	3412 9137	TRIM 4,5-20 PF 160VDC	
CG15	3412 9159	TRIM 4,5-20 PF 160VDC	AB KW03/96
CG16		CAP 22 PF 50V SMD	STANDARD
CG17		CAP 18 PF 50V SMD	STANDARD
CG18		ECAP 2,2 UF 100 V	STANDARD
CG19		CAP 220 PF 50V SMD	STANDARD
CG20	3385 9029	CAP 68 NF 63V	
CG21		ECAP 22 UF 16 V	STANDARD
CG22, 23		CAP 220 NF 25V SMD	STANDARD
CG25 - 31		CAP 220 NF 25V SMD	STANDARD
CG33		ECAP 10 UF 35 V	STANDARD
CG34	3385 9048	CAP 100NF 50V CHIP	
CG35		ECAP 10 UF 35 V	STANDARD
CG36	3385 9048	CAP 100NF 50V CHIP	
CG37	3385 9048	CAP 100NF 50V CHIP	
CG38		CAP 33 NF 50V SMD	STANDARD
CG39		CAP 33 NF 50V SMD	STANDARD
CG40	3385 9043	CAP 10NF 50V SMD	
CG41		CAP 2,2NF 50V SMD	STANDARD
CG42		CAP 150 PF 50V SMD	STANDARD
CG43 - 45		CAP 39 PF 50V SMD	STANDARD
CG46	3422 0228	ECAP 100UF 20% 25V	
CG47		ECAP 470 UF 16 V	STANDARD
CH12		ECAP 47 UF 16 V	STANDARD
CH15		CAP 220 NF 25V SMD	STANDARD
CH16	3385 9043	CAP 10NF 50V SMD	
CH18		CAP 220 NF 25V SMD	STANDARD
CH19	3385 9048	CAP 100NF 50V CHIP	
CH20	3422 0228	ECAP 100UF 20% 25V	
CH21, 22	3385 9048	CAP 100NF 50V CHIP	
CK11	3261 9039	CAP 22 NF 50V	
CK12		CAP 100 PF 50V SMD	STANDARD
CP12	3422 0167	ECAP 1000MF 16V	
CP13	3422 8566	ECAP 1000MF 16V	
CP14		ECAP 22 UF 63 V	STANDARD
CP15	3385 9048	CAP 100NF 50V CHIP	
CP16		ECAP 22 UF 63 V	STANDARD
CP17	3385 9048	CAP 100NF 50V CHIP	
CP18	3422 0169	ECAP 470MF 35V	
CP19	3385 9048	CAP 100NF 50V CHIP	
CP20	3324 8804	SCAP 100NF250V	
CP21	3422 0161	ECAP 33MF 400V	
CP22	3422 0169	ECAP 470MF 35V	
CP23, 24	3385 9048	CAP 100NF 50V CHIP	
CP25	3422 0168	ECAP 2200MF 10V	
CP26	3422 8566	ECAP 1000MF 16V	
CP27		ECAP 10 UF 35 V	STANDARD
CP28	3261 9032	CON 2.2 NF400VAC	
CP30	3385 9048	CAP 100NF 50V CHIP	
CP31		ECAP 47 UF 50 V	STANDARD
CP32		ECAP 2.2 UF 100 V	STANDARD
CP33	3261 9039	CAP 22 NF 50V	
CP34	3422 0228	ECAP 100UF 20% 25V	
CP35, 36		ECAP 47 UF 50 V	STANDARD
CP37, 38	3385 9048	CAP 100NF 50V CHIP	
CP39	3385 9044	CAP 1.0NF 50V CHIP	

Diode

DA11	3656 3596	DIODE BZV55C 3V3
DB13, 16	3657 1136	DIODE 1N 4002
DB32	3657 1136	DIODE 1N 4002
DE19, 20	3656 3484	DIODE BAV 99 70V
DE21	3656 3484	DIODE BAV 99 70V
DE22	3656 3484	DIODE BAV 99 70V
DG24, 25	3656 0810	DIODE 1N 4148
DG33	3656 3458	DIODE BAT 42
DH22	3656 0810	DIODE 1N 4148
DK12, 18	3656 0810	DIODE 1N 4148
DK24, 25	3656 3808	DIODE TSIP 5201
DK26 - 28	3656 3677	DIODE LS 4148
DP11	3656 3810	DIODE UG2D 200V 2000MA
DP14	3656 1507	DIODE BAV 21
DP15	3656 3810	DIODE UG2D 200V 2000MA
DP16	3656 3483	DIODE BZX 83C30
DP17	3656 3806	DIODE UF4503-7000
DP19, 20	3656 3557	DIODE1N 4007
DP21	3656 3810	DIODE UG2D 200V 2000MA
DP23	3656 0810	DIODE 1N 4148
DP24, 25	3656 3557	DIODE1N 4007
DP26	3656 3488	DIODE IN5822
DP27	9634 0025	DIODE BZX 83C
DP32	3656 3807	DIODE P6KE200 200V
DP33	3656 3450	DIODE UF 4005
DP34	3656 1507	DIODE BAV 21

Filter

ZA11	4552 6847	FILTER SFE10,52MJA
ZA12	4552 6845	FILTER SFE10,7MA20
ZA13	4552 6846	FILTER SFE10,7MJA1
ZG22	4421 2369	CRYSTAL17.7 MHZ

Fuse

FP01	4375 2126	FUSE 1,25A T RA

Integrated circuit

IA11	3763 2367	IC 4052
IA13	3771 7057	IC TDA8745
IB01	3771 6363	IC LM 393
IB11	3768 1754	IC LM 317T
IC13	3763 2368	IC 24C65
IC21	3771 6710	IC 4094
IF16	3771 7043	IC STV5730
IG13	3771 6625	IC TEA 6415 B
IG14	3771 7187	IC SDA5649
IH11	3771 6624	IC L 2724
IK13	3763 2359	IC TFSM5380
IK15	3656 3809	DIODE TOT4301NG
IP11	3771 7058	IC TOP201
IP12	3771 6376	IC CNY 17F-2
IP13	3771 6379	IC TL 431

Choke

LA11	4543 3969	COIL 10 UH
LF12	4543 3967	COIL 4,7 UH
LF13, 15	4543 3969	COIL 10 UH
LG11	4551 9284	CHOKE 10UH
LG12, 13	4543 3968	COIL 33 UH
LG14	4551 9284	CHOKE 10UH
LP11, 12	4551 9284	CHOKE 10UH
LP13, 15	4551 9284	CHOKE 10UH
LP16	4543 3814	COIL 5 UH
LP17	4551 9283	MAIN FILTER
LP18	4543 3814	COIL 5 UH
LP19	4551 9285	CHOKE 10UH

Resistor

RA11	3151 8056	RES 1.5E 0,25W	
RA12		RES 390 E 0,25W	STANDARD
RA14		RES 4.7K 0,25W	STANDARD
RA15	3151 7716	RES 1K 0.125W 5% CHIP	
RA16 - 18		RES 330 E 0,25W	STANDARD
RA19		RES 6.8K 0.25W	STANDARD
RA20, 21	3151 7707	RES 100K 0.125W 5% CHIP	
RA22		RES 330 E 0.25W	STANDARD
RA25	3151 7707	RES 100K 0.125W 5% CHIP	
RA26		RES 330 E 0.25W	STANDARD
RA27	3151 7707	RES 100K 0.125W 5% CHIP	
RA28		RES 330 E 0.25W	STANDARD
RA32 - 35	3151 7707	RES 100K 0.125W 5% CHIP	
RA47	3151 7707	RES 100K 0.125W 5% CHIP	
RA48 - 50	3151 7707	RES 100K 0.125W 5% CHIP	
RA54, 55		RES 220 E 0,25W	STANDARD
RA56	3151 7882	RES 1K 0.25W 5% CARF	
RA57		RES 47 K 0,1 W	STANDARD
RB11	3151 7710	RES 10K 0.125W 5% CHIP	
RB12	3151 7821	RES 243 E 0,5W 1%	
RB17		RES 820 E 0,25W	STANDARD
RB18	3151 7710	RES 10K 0.125W 5% CHIP	
RB19		RES 820 E 0.25W	STANDARD
RB20	3151 7822	RES 3,83 K 0,5W 1%	
RB21		RES 4,7K 0.25W	STANDARD
RB22	3151 7820	RES 2,74 K 0.5W 1%	
RB23	3151 7823	RES 9,10 K 0.5W 1%	
RB24		RES 47 K 0.25W	STANDARD
RB25	3151 7706	RES 47K 0.125W 5% CHIP	
RB26		RES 180 K 0.25W	STANDARD
RB27	3151 7710	RES 10K 0.125W 5% CHIP	
RB28, 29		RES 820 E 0,25W	STANDARD
RB30		RES 4,7K 0.25W	STANDARD
RB31	3151 7710	RES 10K 0.125W 5% CHIP	
RB32	3151 7706	RES 47K 0.125W 5% CHIP	
RB33	3151 7705	RES 22K 0.125W 5% CHIP	
RB34		RES 180 K 0.25W	STANDARD
RB35	3151 7709	RES 560R 0.125W 5% CHIP	
RB37		RES 3,9K 0.25W	STANDARD
RB39 - 41	3151 7707	RES 100K 0.125W 5% CHIP	
RB45	3151 7710	RES 10K 0.125W 5% CHIP	
RB50	3151 7710	RES 10K 0.125W 5% CHIP	
RB65 - 67	3151 7924	RES 1,10E 0,5W 1%	
RC11	3151 7716	RES 1K 0.125W 5% CHIP	
RC14	3151 7710	RES 10K 0.125W 5% CHIP	
RC15		RES 390 E 0,25W	STANDARD
RC16	3151 7886	RES 10K 0.25W 5% CARF	
RC17		RES 390 E 0,25W	STANDARD
RC18	3151 7886	RES 10K 0.25W 5% CARF	
RC19		RES 470E 0.25W	STANDARD
RC20		RES 220 E 0.25W	STANDARD
RC21	3151 7707	RES 100K 0.125W 5% CHIP	
RC25	9614 0508	RES 1,2K 0.25W	
RC27, 28	3151 7885	RES 4K7 0.25W 5% CARF	
RC29		RES 470 E 0.25W	STANDARD
RC30		RES 680 E 0.25W	STANDARD
RC35, 36	3151 7710	RES 10K 0.125W 5% CHIP	
RC37		RES 220 E 0,25W	STANDARD
RC38	3151 7710	RES 10K 0.125W 5% CHIP	
RC39		RES 68 E 0,25W	STANDARD
RC40	3151 7888	RES 22 K 0.33W	
RC41		RES 68 E 0,25W	STANDARD
RC42		RES 1.5K 0,5 W	STANDARD
RC42	3151 8077	RES 1.5 K0,25W	F W 05/96
RC44	3151 7716	RES 1K 0.125W 5% CHIP	
RC50 - 52	3151 7710	RES 10K 0.125W 5% CHIP	
RC53	3151 7888	RES 22 K 0.33W	
RC54	3151 7805	SRES 4.7E 0,25W	
RC55		RES 1.5K 0,5 W	STANDARD
RC55	3151 8077	RES 1.5 K0,25W	F W 05/96
RC56	3151 7805	SRES 4.7E 0,25W	
RC57	3151 7716	RES 1K 0.125W 5% CHIP	
RC59	3151 7935	RES 2.7K 0,25W	
RE21	3151 7710	RES 10K 0.125W 5% CHIP	
RE22 - 26	3151 7736	RES 10 E 0.12W CHIP	
RE28		RES 470 E 0.25W	STANDARD
RF06		RES 470 E 0.25W	STANDARD
RF11	3151 7705	RES 22K 0.125W 5% CHIP	
RF14	3151 7716	RES 1K 0.125W 5% CHIP	
RF15	3151 7710	RES 10K 0.125W 5% CHIP	
RF18		RES 680 E 0,25W	STANDARD
RF20	3151 7708	RES 5K6 0.125W 5% CHIP	
RF22		RES 680 E 0,25W	STANDARD
RF23		RES 12 K 0.25W	STANDARD
RF24	3151 7960	RES 301E 0.125W 1%	
RF26	3151 7703	RES 2K2 0.125W 5% CHIP	
RF27, 29	3151 7937	RES 100 E 0.25W	
RF30	3112 9883	VRES 1 K 0,15W	
RF31	3151 7963	RES 1,1K 0,125W	

RF32		RES 820 E 0.25W	STANDARD
RF34		RES 220 E 0,25W	STANDARD
RF36	3151 7708	RES 5K6 0.125W 5% CHIP	
RF40	3151 7707	RES 100K 0.125W 5% CHIP	
RF41		RES 68 E 0,25W	STANDARD
RF43	3151 7705	RES 22K 0.125W 5% CHIP	
RF44		RES 180 E 0.25W	STANDARD
RF45		RES 470 E 0.25W	STANDARD
RF47	3151 7886	RES 10K 0.25W 5% CARF	
RF49		RES 220 E 0.25W	STANDARD
RF51		RES 390 E 0.25W	STANDARD
RF52, 53	3151 7714	RES 1K5 0.125W 5% CHIP	
RF54		RES 150 K 0.25W	STANDARD
RF57	3151 7714	RES 1K5 0.125W 5% CHIP	
RF63		RES 390 E 0.25W	STANDARD
RF64		RES 680 E 0.25W	STANDARD
RF65	3151 7710	RES 10K 0.125W 5% CHIP	
RF66	3151 8056	RES 1.5E 0,25W	
RF67	3151 7805	SRES 4.7E 0,25W	
RF68	3151 7711	RES 0.0 2A JUMPER	
RF69		RES 3.9K 0,25W	STANDARD
RG01, 02		RES 68 E 0,25W	STANDARD
RG03	3151 8056	RES 1.5E 0,25W	
RG11	3151 7724	RES 1R5 0.125W 5% CHIP	
RG12, 13	3151 7706	RES 47K 0.125W 5% CHIP	
RG14		RES 220 E 0,25W	STANDARD
RG15	3151 7935	RES 2.7K 0,25W	
RG16	3151 7716	RES 1K 0.125W 5% CHIP	
RG17		RES 68 E 0,25W	STANDARD
RG18	3151 7936	RES 68 K 0,25W	
RG19	3151 7703	RES 2K2 0.125W 5% CHIP	
RG20	3151 7710	RES 10K 0.125W 5% CHIP	
RG21	3151 7714	RES 1K5 0.125W 5% CHIP	
RG22	3151 7935	RES 2,7K 0,25W	
RG25	3151 7703	RES 2K2 0.125W 5% CHIP	
RG28		RES 6,8k 0.25W	STANDARD
RG30		RES 3,9K 0.25W	STANDARD
RG31	3151 7705	RES 22K 0.125W 5% CHIP	
RG32		RES 6,8K 0,25W	STANDARD
RG34		RES 5,6K 0.25W	STANDARD
RG35	3151 7714	RES 1K5 0.125W 5% CHIP	
RG36	3151 7716	RES 1K 0.125W 5% CHIP	
RG40	3151 7716	RES 1K 0.125W 5% CHIP	
RG41		RES 150 K 0,25W	STANDARD
RG47		RES 68 E 0.25W	STANDARD
RG48	9614 0508	RES 1,2K 0.25W	
RG50		RES 68 E 0.25W	STANDARD
RG53	3151 7928	RES 110 K 0.125W 1%	
RG60	3151 7716	RES 1K 0.125W 5% CHIP	
RG63	3151 7850	RES 75E 0.125W 1%	
RG65		RES 68 E 0.25W	STANDARD
RG67	3151 7882	RES 1K 0.25W 5% CARF	
RG68		RES 68 E 0.25W	STANDARD
RG69	3151 7716	RES 1K 0.125W 5% CHIP	
RG70	3151 8056	RES 1.5E 0,25W	
RG72	3151 7710	RES 10K 0.125W 5% CHIP	
RG73		RES 150 E 0,25W	STANDARD
RG75		RES 180 E 0,25W	STANDARD
RG76	3151 7850	RES 75E 0,125W 1%	
RG77		RES 4.7K 0,25W	STANDARD
RG78	3112 9883	VRES 1 K 0,15W	
RG79		RES 6.8K 0,25W	STANDARD
RG80	3151 7703	RES 2K2 0.125W 5% CHIP	
RG81		RES 4.7K 0,25W	STANDARD
RG82	3151 7716	RES 1K 0.125W 5% CHIP	
RG83		RES 1.2M 0,25W	STANDARD
RG84		RES 12 K 0,25W	STANDARD
RG85	3151 7935	RES 2.7K 0,25W	
RG86	3151 8422	RES 1.2 M 0,25W	
RG88		RES 1 M 0,25W	STANDARD
RG90	3151 8422	RES 1.2 M 0,25W	
RG91	3151 7707	RES 100K 0.125W 5% CHIP	
RG92		RES 6.8K 0,25W	STANDARD
RG93		RES 6.8K 0,25W	STANDARD
RG94	3151 7703	RES 2K2 0.125W 5% CHIP	
RG95, 96	3151 7714	RES 1K5 0,125W 5% CHIP	
RG97		RES 470 E 0,25W	STANDARD
RG98		RES 470 E 0.25W	STANDARD
RH11	3151 7925	SRES 5.6R 0,25W	
RH12	3151 7716	RES 1K 0.125W 5% CHIP	
RH13	3151 7710	RES 10K 0.125W 5% CHIP	
RH14	3151 7886	RES 10K 0.25W 5% CARF	
RH15	3151 7710	RES 10K 0.125W 5% CHIP	
RH16		RES 2.2K 0.25W	STANDARD
RH17	3151 7716	RES 1K 0.125W 5% CHIP	
RH18	3151 7886	RES 10K 0.25W 5% CARF	
RH20	3151 7710	RES 10K 0.125W 5% CHIP	
RH21	3151 7716	RES 1K 0.125W 5% CHIP	
RH22	3151 7849	RES 205K 0.33W 1%	
RH26		RES 68 E 0.25W	STANDARD
RH27	3151 7723	RES 3.9E 0.125W CHIP	
RH28	3151 7719	RES 2.7E 0.125W CHIP	
RH29	3151 7710	RES 10K 0.125W 5% CHIP	
RH30	3151 7716	RES 1K 0.125W 5% CHIP	
RH33	3151 7706	RES 47K 0.125W 5% CHIP	
RH36, 37		RES 1.2E 0,25W	STANDARD
RH39	3151 7847	RES 115 K 0,5W 1%	
RH40		RES 120 K 0,25W	STANDARD
RH41	3151 7886	RES 10K 0.25W 5% CARF	
RH42	3151 7888	RES 22 K 0.33W	
RH44	3151 7848	RES 1.1 K 0,33W 1%	
RH46	3151 7703	RES 2K2 0.125W 5% CHIP	
RH47	3151 7845	RES 90,9K 0,5W 1%	
RH49	3151 7963	RES 1.1K 0,125W	
RH50		RES 4.7K 0,25W	STANDARD
RH51		RES 1.5K 0,5 W	STANDARD
RH51	3151 8077	RES 1.5 K0,25W F W 05/96	
RH52		RES 330 E 0,25W	STANDARD
RH53, 54		RES 4.7K 0.25W	STANDARD
RH55		RES 1.5K 0,5 W	STANDARD
RH55	3151 8077	RES 1.5 K0,25W	F W 05/96
RH56	3151 7710	RES 10K 0.125W 5% CHIP	
RH57		RES 150 E 0,25W	STANDARD
RK11		RES 680 E 0,25W	STANDARD
RK13		RES 150 E 0,25W	STANDARD
RK14		RES 39 E 0,25W	STANDARD
RK15		RES 100 K 0,25W	STANDARD
RK16	3151 7937	RES 100 E 0.25W	
RK17	3151 7710	RES 10K 0.125W 5% CHIP	
RK26		RES 150 E 0,25W	STANDARD
RK27	3151 8048	SRES 6.8E 0.25W	
RK28		RES 150 E 0.25W	STANDARD
RK29	3151 7710	RES 10K 0.125W 5% CHIP	
RK30	3151 7882	RES 1K 0.25W 5% CARF	
RK31	3151 8048	SRES 6.8E 0,25W	
RK32		RES 150 E 0,25W	STANDARD
RK33		RES 2.2K 0,25W	STANDARD
RK34, 35		RES 150 E 0,25W	STANDARD
RK36		RES 220 E 0,25W	STANDARD
RK37	3151 8048	SRES 6.8E 0,25W	
RK38		RES 150 E 0,25W	STANDARD
RK42		RES 2.2K 0,25W	STANDARD
RK43, 44		RES 150 E 0,25W	STANDARD
RK45		RES 2,2K 0,25W	STANDARD
RK46	3151 8048	SRES 6.8E 0,25W	
RK47, 48	3151 7716	RES 1K 0.125W 5% CHIP	
RK49		RES 680 E 0,25W	STANDARD
RK50, 51	3151 7719	RES 2.7E 0.125W CHIP	
RP14		RES 3.3K 1 W	STANDARD
RP15, 16		RES 180 E 0,25W	STANDARD
RP17	3151 7885	RES 4K7 0.25W 5% CARF	
RP19	3151 7710	RES 10K 0.125W 5% CHIP	
RP20		RES 47 E 0.25W	STANDARD
RP22	3151 7885	RES 4K7 0.25W 5% CARF	
RP26	3151 7924	RES 1,10E 0.5W 1%	
RP28		RES 820 E 0.25W	STANDARD
RP29		RES 6,8K 0.25W	STANDARD
RP30	3151 7846	RES 51 E 0.33W 1%	
RP32	3151 7710	RES 10K 0.125W 5% CHIP	
RP34		RES 47 K 0.25W	STANDARD
RP35		RES 150 E 0,25W	STANDARD
RP36	3151 7820	RES 2.74 K 0.5W 1%	
RP37	3151 8002	RES 3,3K 0.5 W	
RP38	3151 7924	RES 1.10E 0.5W 1%	
RP39	3151 7937	RES 100 E 0.25W	
RP40		RES 270 E 0.25W	STANDARD
RP41		RES 150 E 0.25W	STANDARD
RP42, 43	3151 7710	RES 10K 0.125W 5% CHIP	

RP44, 45		RES 4.7K 0.25W	STANDARD

Transistor

TA21, 22	3614 5312	TRANS BC 847B	
TB11, 12	3656 3593	TRANS BC 369	
TB14	3614 5312	TRANS BC 847B	
TB15	3656 3593	TRANS BC 369	
TB17 - 19	3614 5312	TRANS BC 847B	
TC12	3614 4533	TRANS BC 857B CHIP	
TC13	3614 5312	TRANS BC 847B	
TC14	3614 4533	TRANS BC 857B CHIP	
TC15	3614 5312	TRANS BC 847B	
TC18	3614 5312	TRANS BC 847B	
TC20 - 22	3614 5312	TRANS BC 847B	
TC26, 27	3614 5312	TRANS BC 847B	
TF11	3614 4533	TRANS BC 857B CHIP	
TF13	3614 4533	TRANS BC 857B CHIP	
TF16, 17	3614 5312	TRANS BC 847B	
TF19	3614 5312	TRANS BC 847B	
TF20, 21	3614 4533	TRANS BC 857B CHIP	
TF25	3614 5312	TRANS BC 847B	
TG11	3614 4533	TRANS BC 857B CHIP	
TG12 - 14	3614 5312	TRANS BC 847B	
TG27	3614 5312	TRANS BC 847B	
TG31, 32	3614 5312	TRANS BC 847B	
TG34, 35	3614 4533	TRANS BC 857B CHIP	
TH11	3656 3593	TRANS BC 369	
TH12	3614 4533	TRANS BC 857B CHIP	
TH13	3614 5312	TRANS BC 847B	
TH15	3614 4533	TRANS BC 857B CHIP	
TH23	3614 4533	TRANS BC 857B CHIP	
TH24	3614 5312	TRANS BC 847B	
TK14, 15	3614 4533	TRANS BC 857B CHIP	
TK17	3614 7304	TRANS BC 807-25	
TK19	3614 4209	TRANS BC 327-25	
TK20, 21	3614 7304	TRANS BC 807-25	
TK22	3614 4209	TRANS BC 327-25	
TK23	3614 4533	TRANS BC 857B CHIP	
TP13	3614 7601	TRANS BC 636-10	
TP18	3614 5312	TRANS BC 847B	
TP30, 31	3614 7586	TRANS BC 368	

Connectors

XA01	9434 0178	PHONOCONNECT
XE11	4144 8455	RFK5 10 PIN CONNECTOR 10-CONTS
XG02	4144 8456	PIN HEADER DOUBLE 2x13 GOLD
XG11 - 13	4144 8364	SOCKET SCART 21PIN
XH11	4144 8412	CONNECTOR POLARIZER 4-POL
XK11 - 13	4112 7519	SWITCH
XP01	4144 8457	HEADER RGT X2 2-POL YELLOW

Miscellaneous on the main board

EE01	5856 5006	CARD READER
IF13	5823 3654	TUNER UNIT
TP01	4511 3550	TRANSFORMER FM3301
UG11	5826 0567	MODULATOR

Processor module 6913 6704

Crystal

AU01	4421 2258	CRYSTAL 8,00MHZ
AU02	4421 2287	CRYSTAL 32.768KHZ

Capacitor

CU01	3385 9047	CAP 100NF 50V CHIP	
CU02		CAP 27 PF 50V SMD	STANDARD
CU03	3385 9072	CAP 33 PF 50V SMD	
CU04 - 06	3385 9047	CAP 100NF 50V CHIP	
CU07		ECAP 22 UF 5.5 V	STANDARD
CU08	3385 9072	CAP 33 PF 50V SMD	
CU09	3385 9047	CAP 100NF 50V CHIP	
CU12		CAP 22 PF 50V SMD	STANDARD

Diode

DU01	3656 3677	DIODE LS 4148

Integrated circuit

IU01	3763 2370	IC MC68HC05E0
IU02	3763 2371	IC M27C512
IU03	3771 6878	HEF4094BT
IU04	3771 7061	IC M8716B
IU05	3763 2369	IC MAX809LEUR

Resistor

RU01	3151 7716	RES 1K 0.125W 5% CHIP	
RU02		RES 10 M 0.25W	STANDARD
RU03	3174 9201	RES NET7	
RU04	3151 7709	RES 560R 0.125W 5% CHIP	

Connectors

XU01, 02	4144 8454	PIN HEADER 20 PIN

VideoCrypt module 6913 6864

Capacitor

CL02, 03		CAP 220 NF 25V SMD	STANDARD
CL04		CAP 3.3NF 50V SMD	STANDARD
CL08	3422 0224	ECAP 1.0UF 20% 100V	
CL09		CAP 220 NF 25V SMD	STANDARD
CL10		CAP 100 PF 50V SMD	STANDARD
CL11	3422 6302	ECAP 10MF 63V	
CL12	3385 9045	CAP 4.7NF 50V CHIP	
CL13		CAP 33 NF 50V SMD	STANDARD
CL14		ECAP 4.7UF 63V	STANDARD
CL15		ECAP 47 UF 50 V	STANDARD
CL16	3385 9048	CAP 100NF 50V CHIP	
CL17	3385 9045	CAP 4.7NF 50V CHIP	
CV04		ELKO 4.7UF 63V	STANDARD
CV06		ECAP 47 UF 50 V	STANDARD
CV07	3385 9048	CAP 100NF 50V CHIP	
CV08		CAP 39 PF 50V SMD	STANDARD
CV09		CAP 27 PF 50V SMD	STANDARD
CV10	3385 9046	CAP 180PF 50V CHIP	
CV11		CAP 120 PF 50V SMD	STANDARD
CV12	3385 9046	CAP 180PF 50V CHIP	
CV13		CAP 82 PF 50V SMD	STANDARD
CV14		ECAP 47 UF 50 V	STANDARD
CV15	3385 9048	CAP 100NF 50V CHIP	
CV16	3385 9043	CAP 10NF 50V SMD	
CV17	3385 9048	CAP 100NF 50V CHIP	
CV18	3385 9043	CAP 10NF 50V SMD	
CV19	3385 9048	CAP 100NF 50V CHIP	
CV20		ELKO 4.7UF 63V	STANDARD
CV21	3385 9048	CAP 100NF 50V CHIP	
CV22		CAP 22 PF 50V SMD	STANDARD
CV23	3385 9049	CAP 56 PF 50V CHIP	
CV24	3385 9099	CAP 47PF 50V CHIP	
CW01, 02	3385 9048	CAP 100NF 50V CHIP	
CW03	3385 9043	CAP 10NF 50V SMD	
CW04	3385 9048	CAP 100NF 50V CHIP	
CW05	3385 9086	CAP 15 PF 50 V	
CW11	3385 9048	CAP 100NF 50V CHIP	
CW16	3385 9072	CAP 33 PF 50V SMD	
CW17	3422 0224	ECAP 1.0UF 20% 100V	
CW18	3385 9048	CAP 100NF 50V CHIP	
CW19, 20	3385 9043	CAP 10NF 50V SMD	
CW20	3385 9048	CAP 100NF 50V CHIP	
CW21		ECAP 47 UF 50 V	STANDARD

Diode

DL02, 03	3656 3484	DIODE BAV 99 70V
DL04	3656 3677	DIODE LS 4148
DV01, 02	3656 3677	DIODE LS 4148

Integrated circuit

IL01	3763 2360	IC PTV 111	
IV01	3763 2361	IC PTV 110	
IW01	3763 2362	IC PTV 114	
IW02	3763 2363	IC PTV 112	
IW03	3763 2402	IC PTV 115C	
IW04	3763 2365	IC PTV 113	
IW05	3771 6811	IC 74LS04	

Choke

LV02, 03	4543 3969	COIL 10 UH	
LV04	4543 3812	COIL 1 UH	

Crystal

QL01	4421 2250	CRYSTAL 503 KHZ	
QV01	4421 2251	CRYSTAL 28.000 MHZ	

Resistor

RL02	3151 7713	RES 470K 0.125W CHIP	
RL03	3151 7716	RES 1K 0.125W 5% CHIP	
RL04		RES 470 E 0,25W	STANDARD
RL11	3151 7935	RES 2,7K 0,25W	
RL12	3151 7710	RES 10K 0.125W 5% CHIP	
RL13		RES 820 E 0,25W	STANDARD
RL14		RES 4.7K 0.25W	STANDARD
RL15	3151 7716	RES 1K 0.125W 5% CHIP	
RL16		RES 470 E 0.25W	STANDARD
RL17	3151 8009	RES 3,3K 0.125W	
RL18		RES 270 K 0.25W	STANDARD
RL19		RES 3.9K 0.25W	STANDARD
RL20	3151 7935	RES 2,7K 0.25W	
RL22	3151 7708	RES 5K6 0.125W 5% CHIP	
RL23		RES 3,9K 0.25W	STANDARD
RL24	3151 8056	RES 1.5E 0.25W	
RL25		RES 47 K 0.25W	STANDARD
RV05		RES 68 E 0.25W	STANDARD
RV06	3151 7724	RES 1R5 0.125W 5% CHIP	
RV07	3151 7935	RES 2,7K 0.25W	
RV08	3151 7716	RES 1K 0.125W 5% CHIP	
RV10		RES 680 E 0,25W	STANDARD
RV11		RES 220 E 0.25W	STANDARD
RV12	3151 7702	RES 270E 0.125W CHIP	
RV13		RES 220 E 0.25W	STANDARD
RV14	3151 7960	RES 301E 0.125W 1%	
RV15	3151 8061	RES 332 E 0.125W 1%	
RV20, 21	3151 7706	RES 47K 0.125W 5% CHIP	
RV23		RES 4,7K 0.25W	STANDARD
RV24	3151 7716	RES 1K 0.125W 5% CHIP	
RV25	3151 7709	RES 560R 0.125W 5% CHIP	
RV26	3151 7931	RES 510 E 0.125W 1%	
RV27		RES 47 E 0.25W	STANDARD
RV28	3151 7716	RES 1K 0.125W 5% CHIP	
RV29	3151 7703	RES 2K2 0.125W 5% CHIP	
RV30		RES 470 E 0.25W	STANDARD
RV31		RES 680 E 0.25W	STANDARD
RV32	3151 7709	RES 560R 0.125W 5% CHIP	
RV33		RES 330 E 0.25W	STANDARD
RV34		RES 470 E 0.25W	STANDARD
RV35	3151 7935	RES 2,7K 0.25W	
RV36	3151 8426	RES 249 E 0.125W 1%	
RV37		RES 390 E 0.25W	STANDARD
RV38		RES 330 E 0.25W	STANDARD
RV39, 40	3151 7710	RES 10K 0.125W 5% CHIP	
RV41	3151 7995	SRES 1 E 0.25W	
RV42	3151 7710	RES 10K 0.125W 5% CHIP	
RV44		RES 1.2 K 0.25W	
RV46		RES 100 E 0.25W	STANDARD
RV47		RES 1 M 0.25W	STANDARD
RV48	3151 7937	RES 100 E 0.25W	
RV50		RES 12 K 0.25W	STANDARD
RV51	3151 7703	RES 2K2 0.125W 5% CHIP	
RV53		RES 220 E 0.25W	STANDARD
RV54	3151 7716	RES 1K 0.125W 5% CHIP	
RV55	3151 7937	RES 100 E 0.25W	
RV56	3151 7702	RES 270E 0.125W CHIP	
RV57	3151 7714	RES 1K5 0.125W 5% CHIP	
RV03	3151 7714	RES 1K5 0.125W 5% CHIP	
RW04	3151 7704	RES 3,3 K 0.125W CHIP	
RW05 - 11		RES 56 E 0,25W	STANDARD
RW12		RES 56 E 0,25W	STANDARD
RW13	3151 7710	RES 10K 0.125W 5% CHIP	
RW14		RES 4,7K 0.25W	STANDARD
RW15, 16	3151 7710	RES 10K 0.125W 5% CHIP	
RW17	3151 7715	RES 33 K 0.125W CHIP	
RW18, 19	3151 7710	RES 10K 0.125W 5% CHIP	
RW20	3151 7886	RES 10K 0.25W 5% CARF	
RW21	3151 7710	RES 10K 0.125W 5% CHIP	
RW23	3151 7710	RES 10K 0.125W 5% CHIP	
RW27, 28	3151 7710	RES 10K 0.125W 5% CHIP	
RW31	3151 7710	RES 10K 0.125W 5% CHIP	
RW32	3151 7886	RES 10K 0.25W 5% CARF	
RW33	3151 7710	RES 10K 0.125W 5% CHIP	
RW34	3151 7886	RES 10K 0.25W 5% CARF	
RW35		RES 470 E 0,25W	STANDARD
RW39	3151 7710	RES 10K 0.125W 5% CHIP	
RW47		RES 4,7K 0.25W	STANDARD
RW48		RES 4,7K 0.25W	STANDARD
RW50 - 52	3151 7710	RES 10K 0.125W 5% CHIP	
RW53		RES 4,7K 0.25W	STANDARD
RW54	3151 7710	RES 10K 0.125W 5% CHIP	
RW55	3151 7995	SRES 1 E 0,25W	
RW56, 57		RES 4,7K 0.25W	STANDARD
RW58		RES 47 E 0.25W	STANDARD
RW59	9614 0508	RES 1,2 K 0.25W	

Transistor

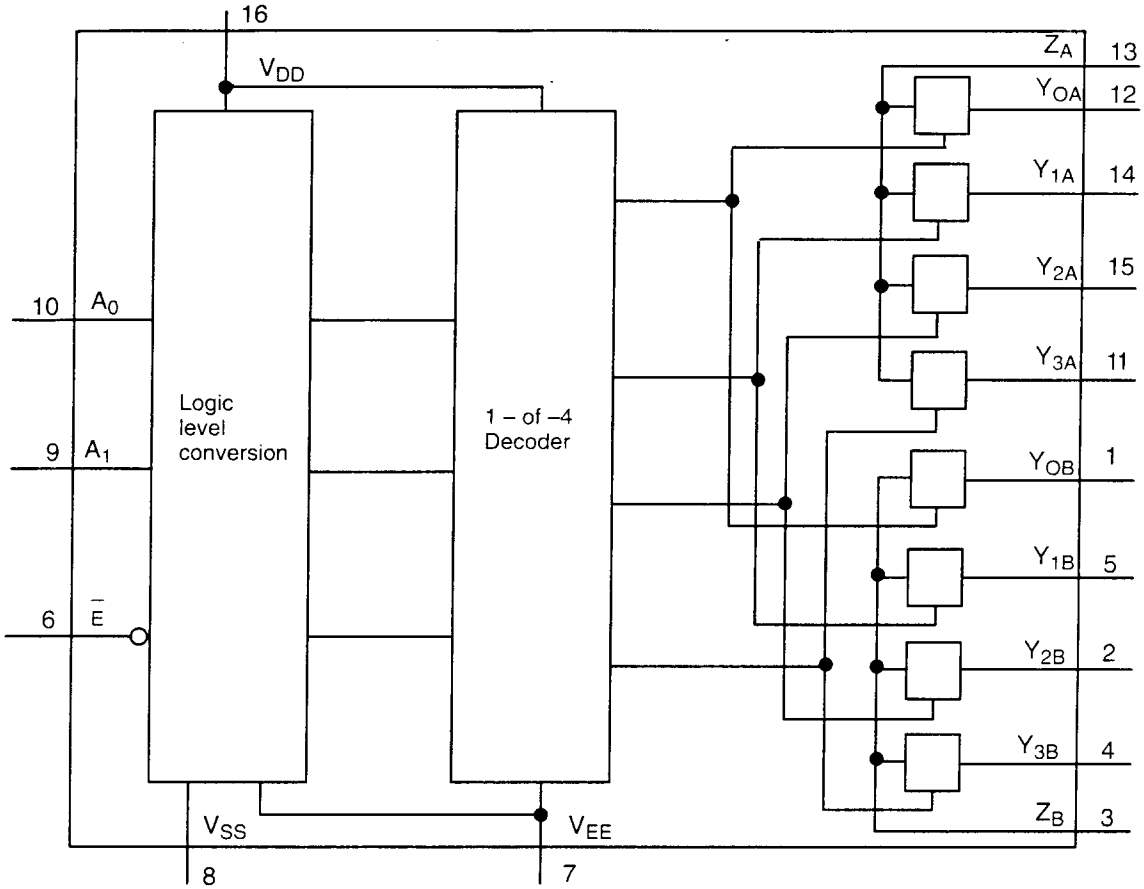
TL01	3614 4533	TRANS BC 857B CHIP
TL04, 05	3614 5312	TRANS BC 847B
TV03	3614 5312	TRANS BC 847B
TV04	3614 4533	TRANS BC 857B CHIP
TV06	3614 4533	TRANS BC 857B CHIP
TV07	3614 5312	TRANS BC 847B
TV08, 09	3614 4533	TRANS BC 857B CHIP
TV10	3614 5312	TRANS BC 847B
TV11 - 13	3614 4533	TRANS BC 857B CHIP
TV14	3614 5312	TRANS BC 847B
TV15, 16	3614 4533	TRANS BC 857B CHIP
TW01	3614 6424	TRANS BC 557B
TW02	3614 5312	TRANS BC 847B

Connector

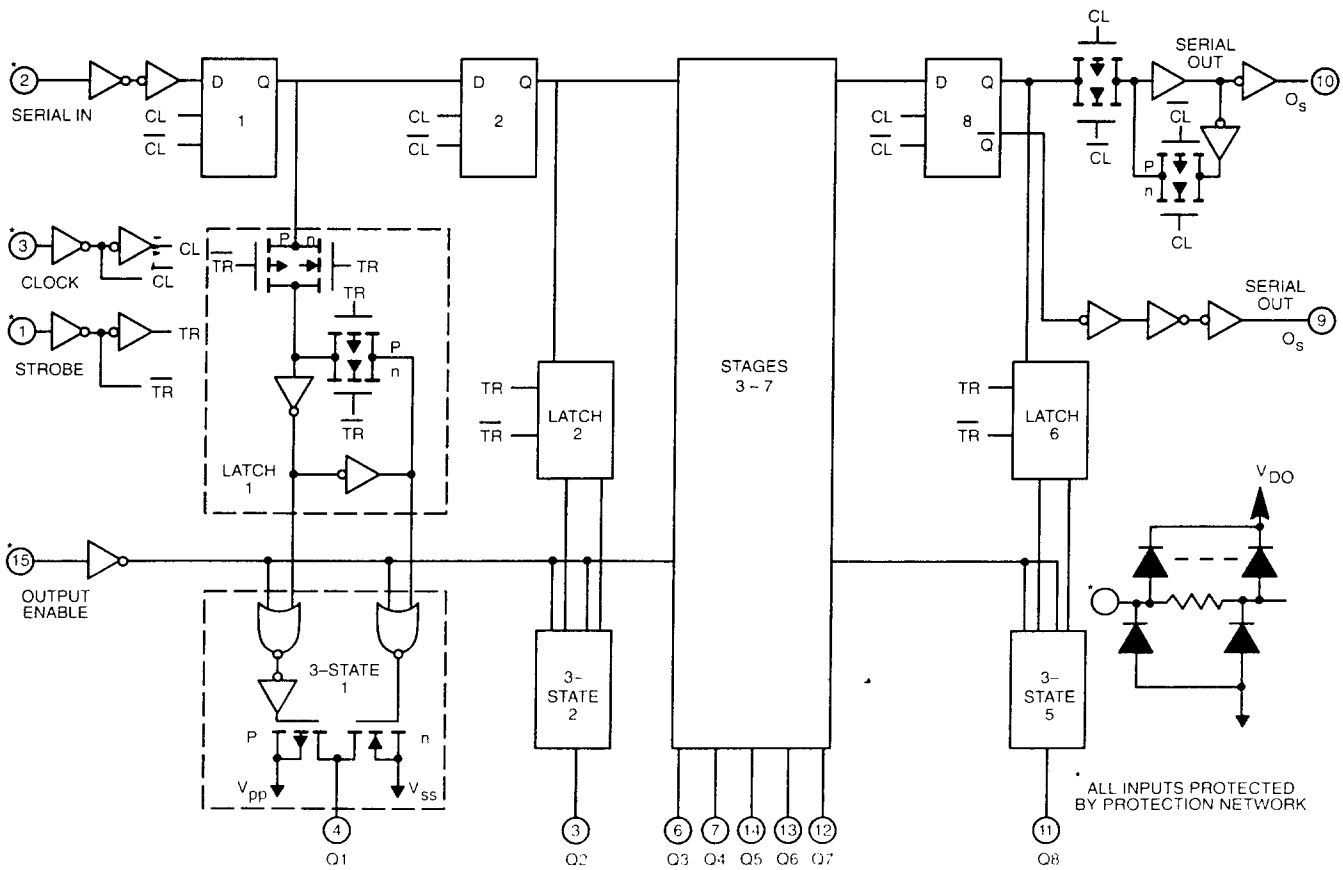
XV01	7342 8803	KONTAKT

Block diagrams IC:s

Main PC Board **IA 11 4052** **Analogue multiplexer / demultiplexer**

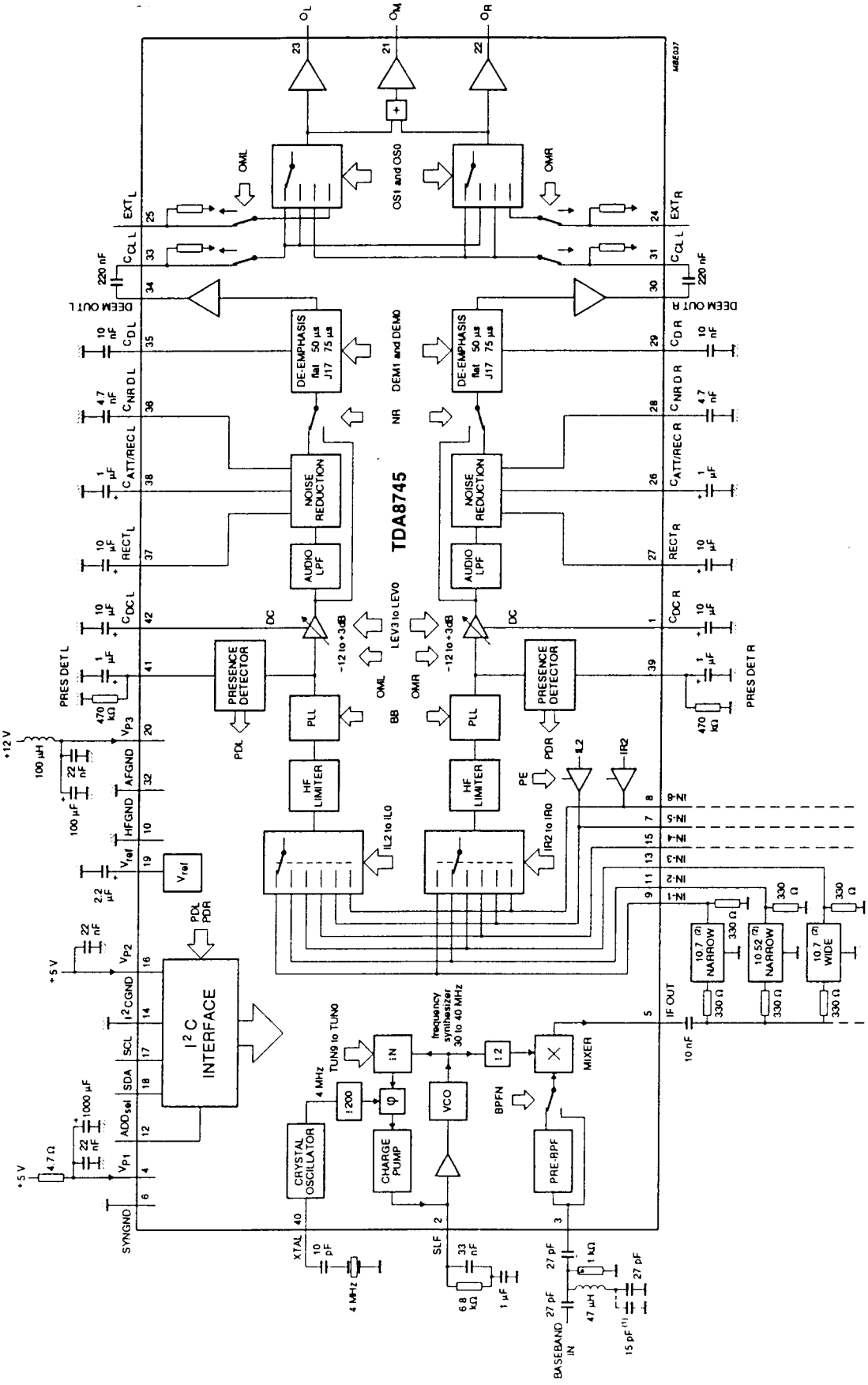


Main PC Board **IC 21, IU 03 4094** **8-stage shift - and store bus register**

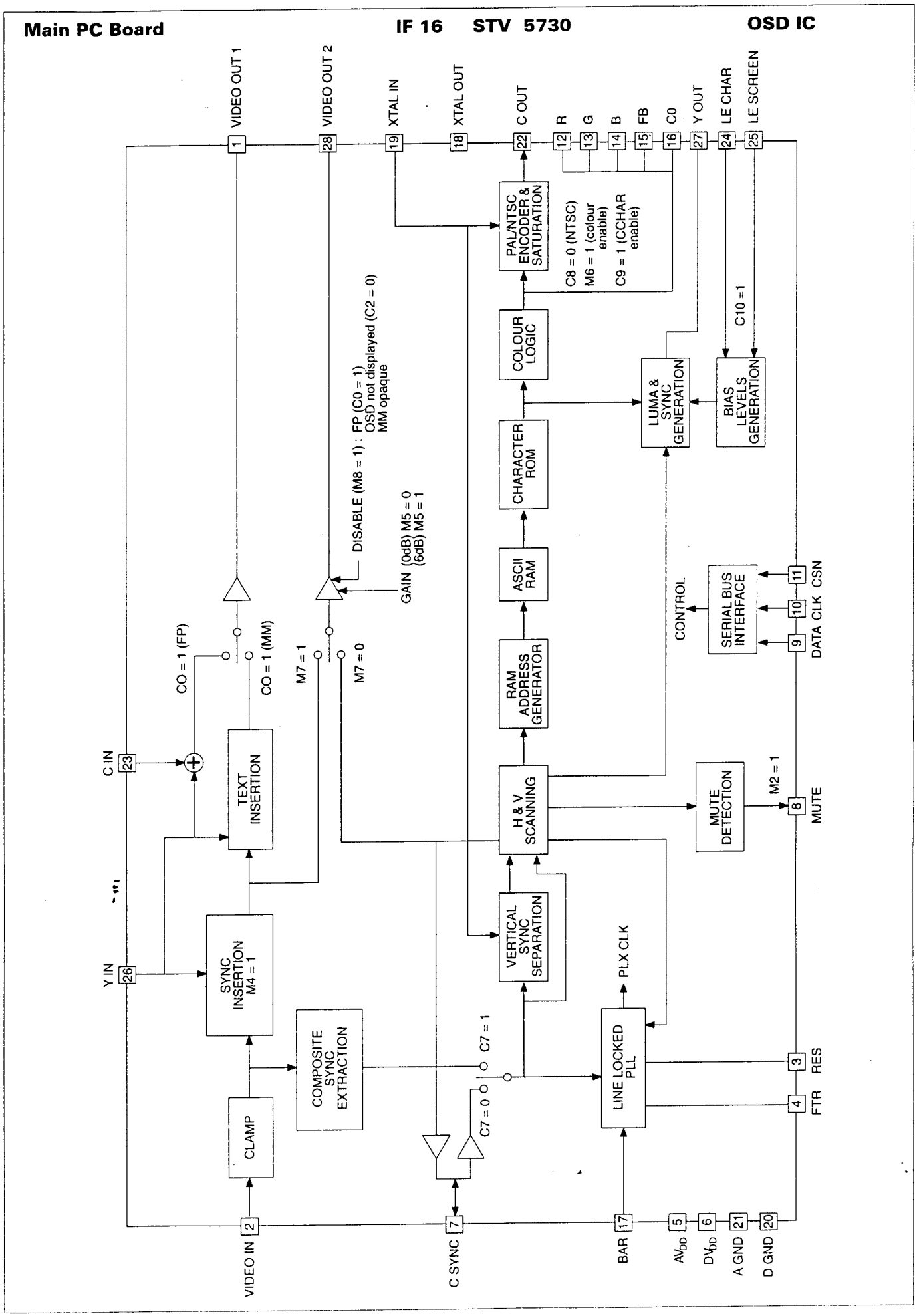


Block diagrams IC:s

Main PC Board **IA 13** **TDA 8745** **Satellite sound circuit with synthesizer under I² C control**

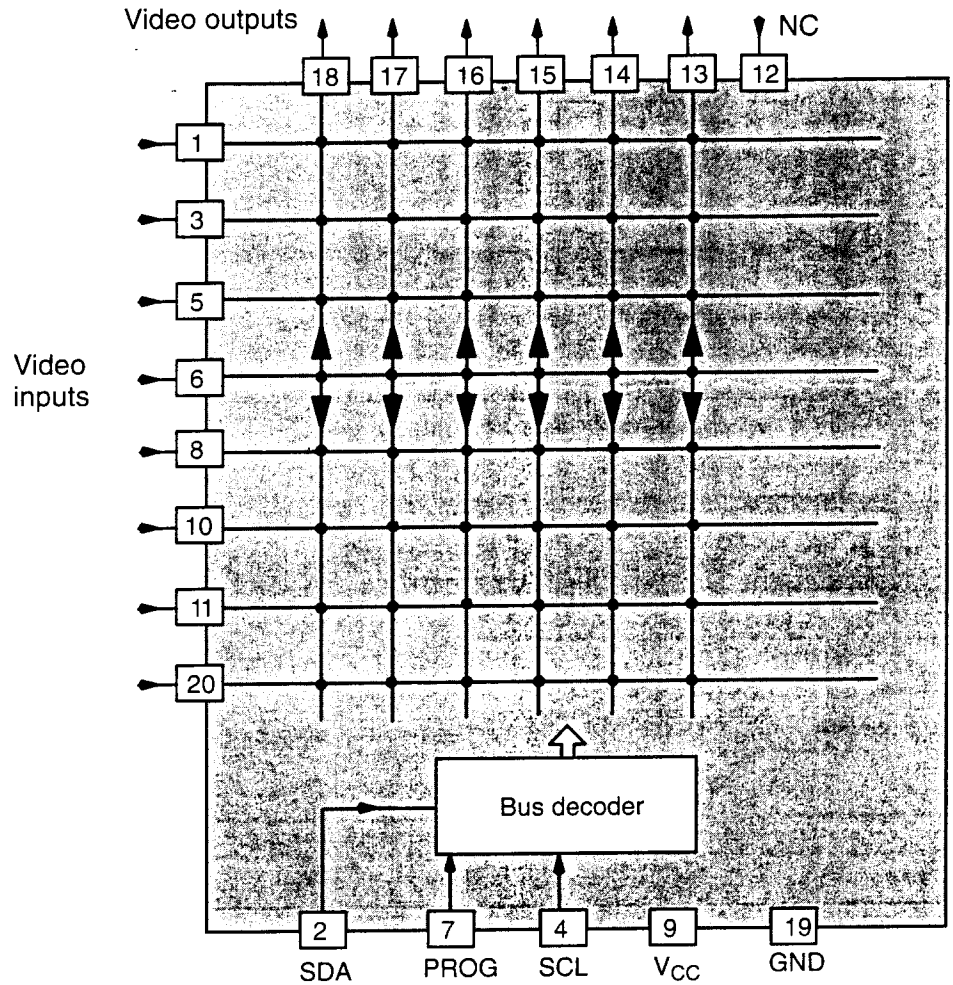


Block diagrams IC:s

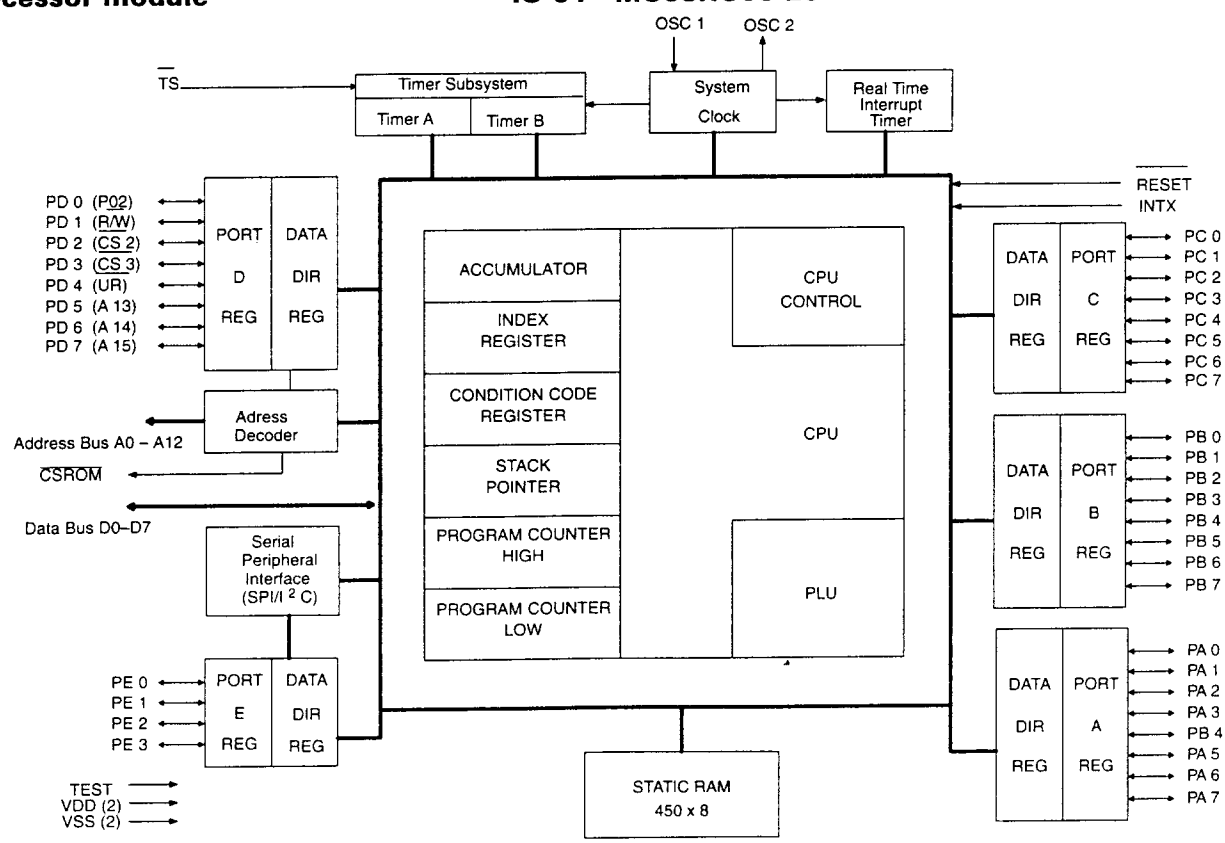


Block diagrams IC:s

Main PC Board **IG 13** **TEA 6415B** **Bus controlled video matrix switch**

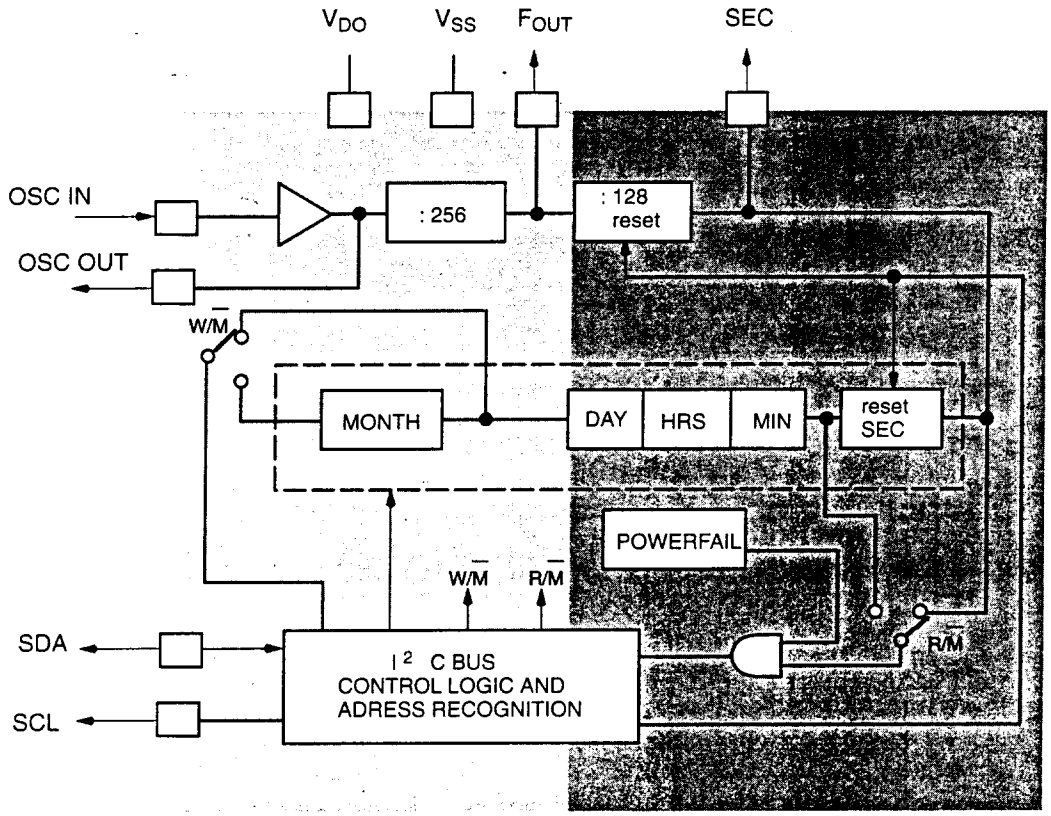


Processor module **IU 01** **MC68HC05 E0** **Processor**



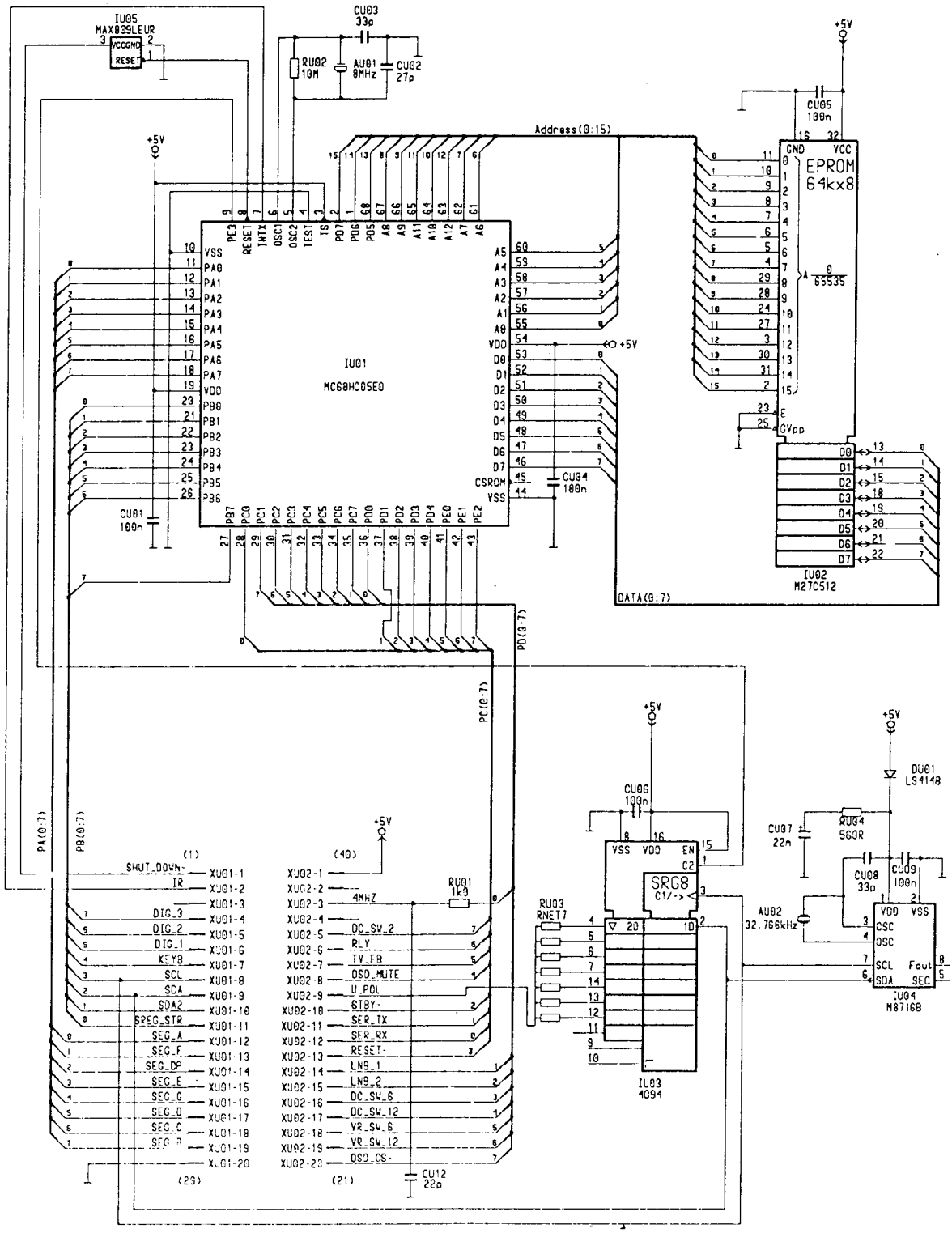
Block diagrams IC:s

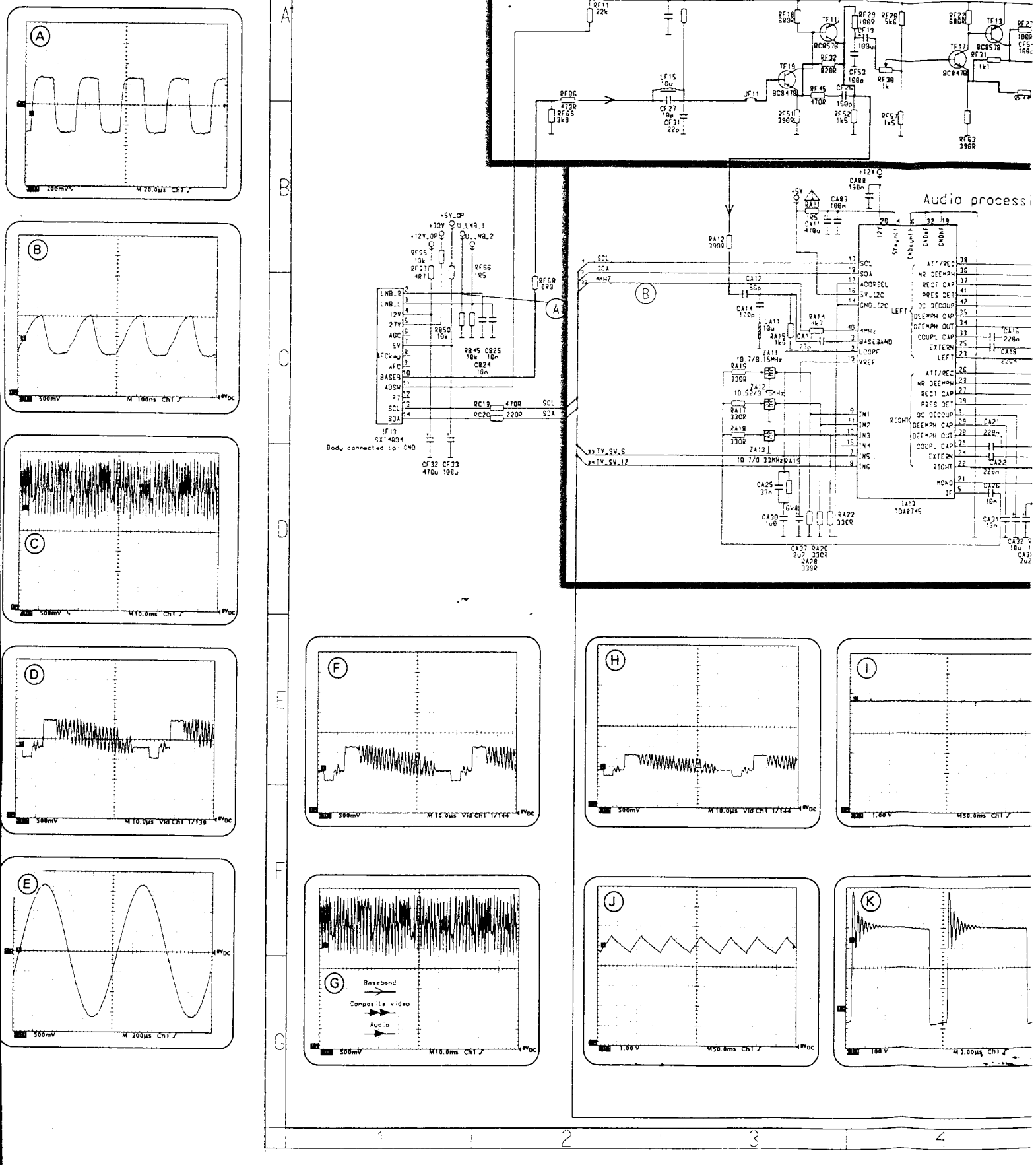
Processor module **IU 04** **M 8716B** **Clock / Calender with serial I² C bus**

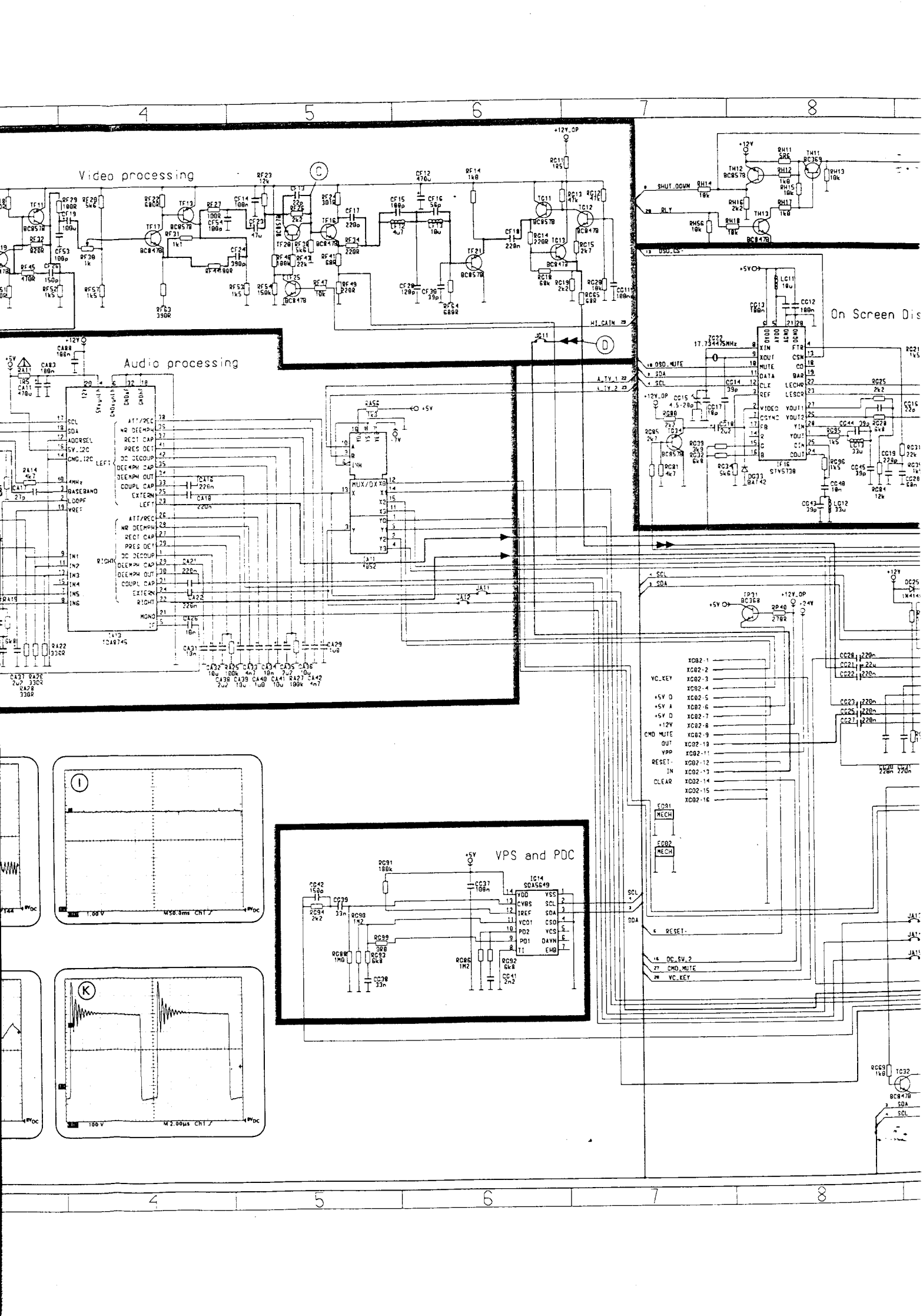


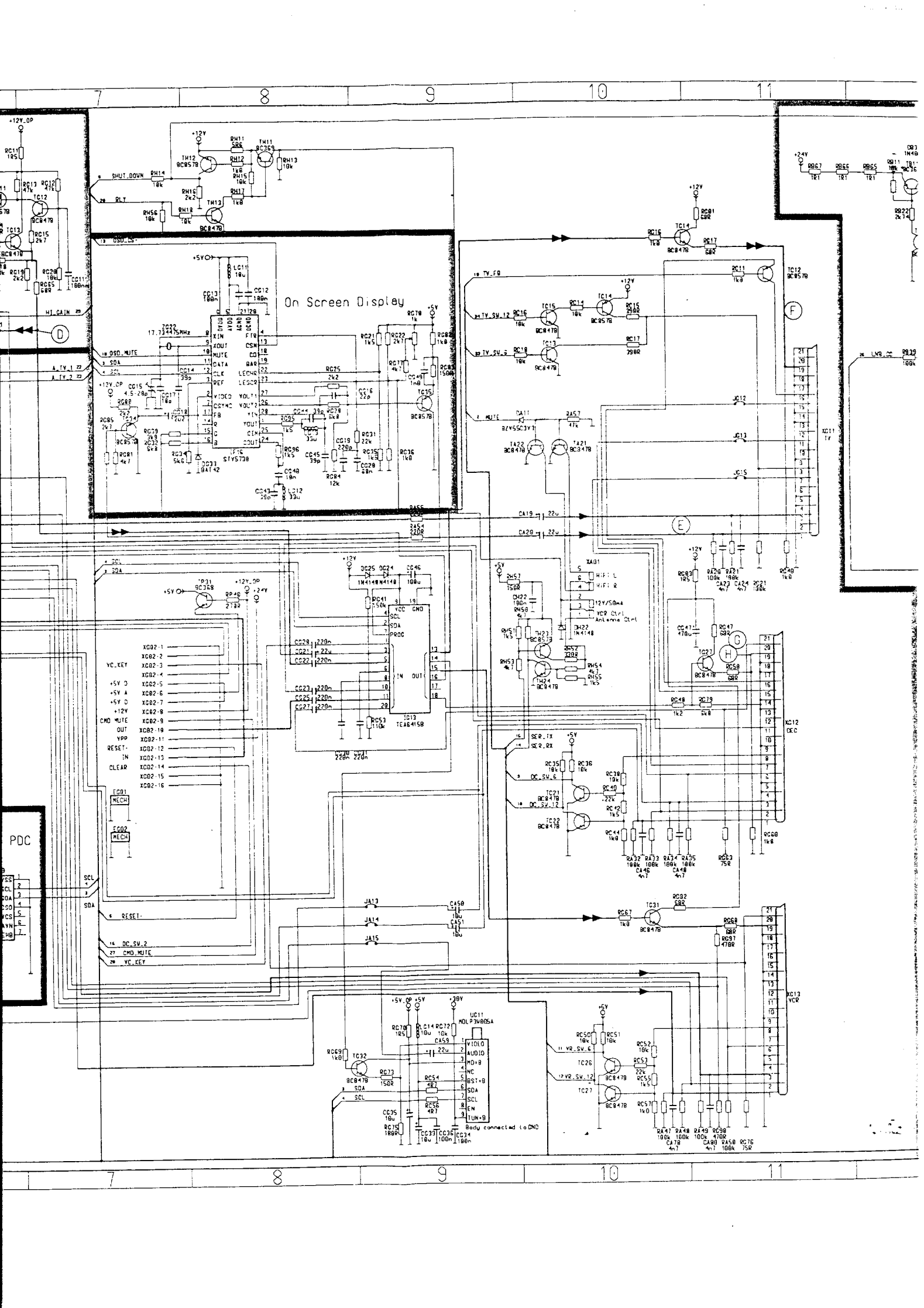
Schematic diagram Processor module

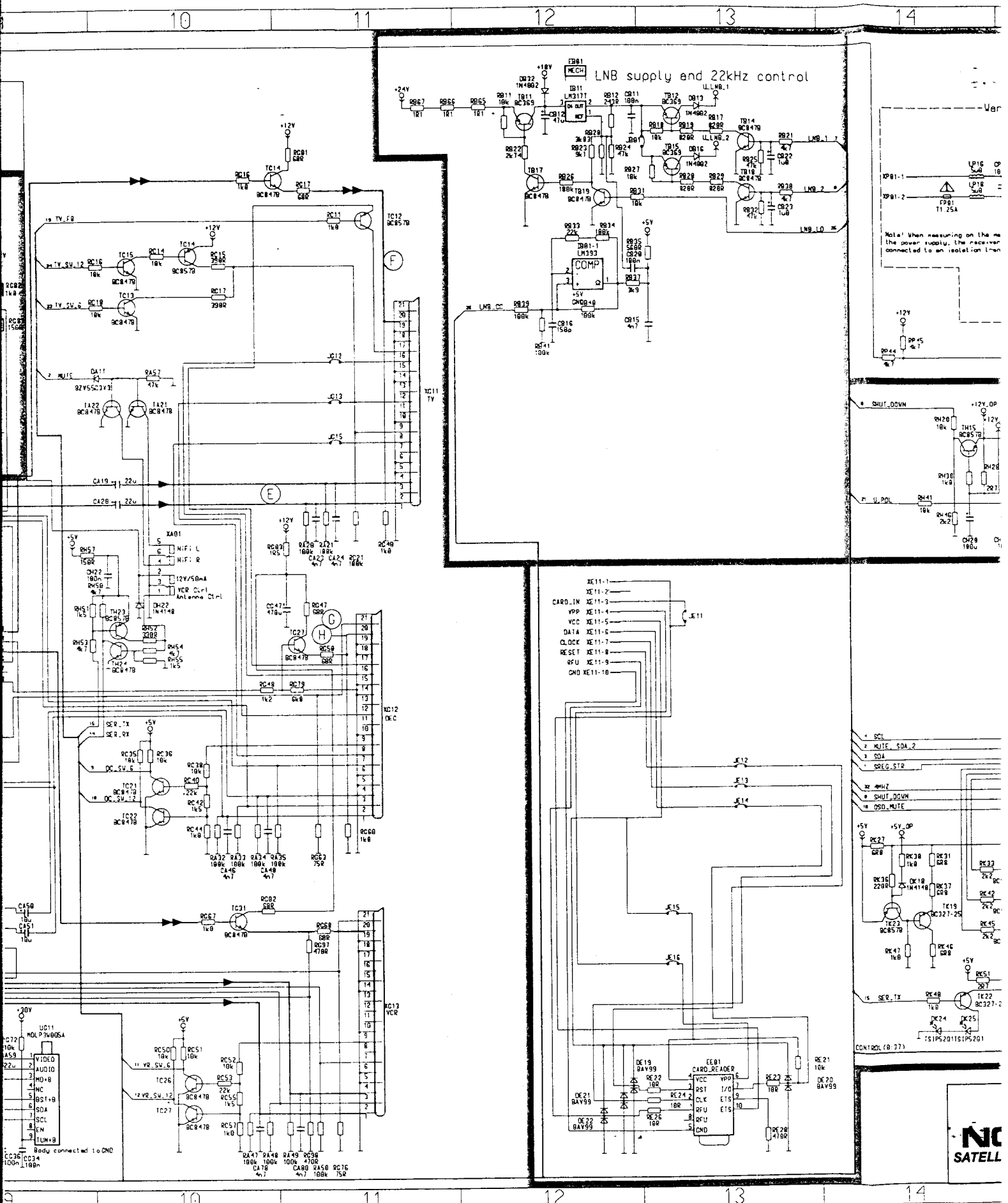
Processor board No: 6913 67 04

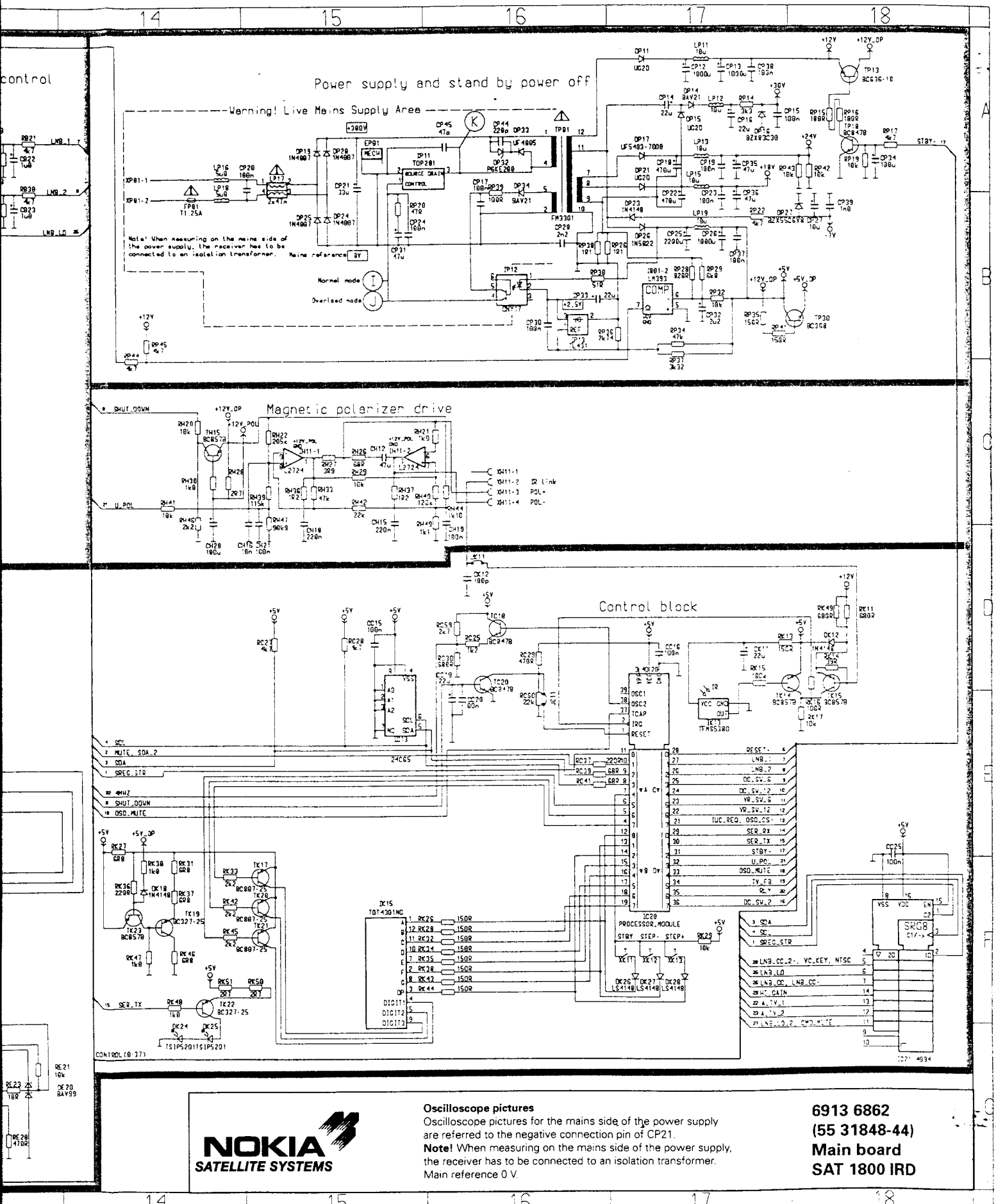



Video processing
Audio processi
Baseband
Composite video
Audio


4
5
6
7
8
Video processing
Audio processing
On Screen Dis
VPS and PDC
SHUT_DOWN
RLY
OSD_CS
HI_CAIN
OSD_MUTE
SCL
SDA
RESET
OC_SV_2
CMD_MUTE
VC_KEY
BASEBAND
LOOPF
VREF
LEFT
RIGHT
MONO
MECH
+12V_OP
+5V
+24V


On Screen Display
PDC
SHUT_DOWN
RLY
OSD_ES-
HI_GAIN
OSD_MUTE
SCL
SDA
A_TV_1
A_TV_2
TV-FB
TV_SW_12
TV_SW_3
MUTE
RESET-
DC_SW_2
CMD_MUTE
VC_KEY
DC_SW_6
DC_SW_12
VR_SW_6
VR_SW_12
Body connected to GND


LNB supply and 22kHz control
CARD_READER
SATELL


Power supply and stand by power off
Warning! Live Mains Supply Aree
Note! When measuring on the mains side of the power supply, the receiver has to be connected to an isolation transformer.
Mains reference
Normal mode
Overload mode
Magnetic polarizer drive
Control block
IC28
PROCESSOR_MODULE
24C65
SRG8

Oscilloscope pictures
Oscilloscope pictures for the mains side of the power supply are referred to the negative connection pin of CP21.
Note! When measuring on the mains side of the power supply, the receiver has to be connected to an isolation transformer.
Main reference 0 V.

NOKIA
SATELLITE SYSTEMS

6913 6862
(55 31848-44)
Main board
SAT 1800 IRD